

# The Chemical Age

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## Contents

	PAGE
EDITORIAL NOTES: A Disinfectant Manufacturers' Association; A Scientist Misunderstood; Nitrogen Developments; The B.I.F. Catalogue .....	1
Impending Developments in the Fertiliser Industry, by Dr. Emil Collett .....	3
Research and Industry, by W. P. Dreaper .....	5
Damage to Paintings by Mould .....	6
Correspondence: Income Tax Problems; Rationalising the Chemist .....	7
A Bookman's Column .....	9
From Week to Week .....	10
References to Current Literature .....	11
Patent Literature .....	12
Weekly Chemical Prices and Market Reports .....	14
Company News .....	18
Commercial Intelligence; New Companies Registered .....	20
MONTHLY METALLURGICAL SECTION: Copper Alloys Containing Silicon, etc. ....	1-6

**NOTICES.**—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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## A Disinfectant Manufacturers' Association

THE growing appreciation of the value of trade associations for protecting the interests of their members is exemplified by the formation of a new British Disinfectant Manufacturers' Association, the inaugural meeting of which was held recently in the rooms of the Chemical Society, Burlington House, London. There was a good attendance, and close on 50 firms representative of all the branches of the disinfectant trade signified their intention of joining the new Association. One of the main objects of the latter is to protect and further the mutual trade interests of its members, to foster the manufacture of British disinfectants and promote closer co-operation between British disinfectant manufacturers. The Association will also serve as a medium for placing before Government Departments or other public bodies, at home and abroad, the views of British disinfectant manufacturers on matters affecting their industry. This is a very important function at the present time, when legislation, which may affect many branches of industry, is either in train or threatened.

At the inaugural meeting, the rules of the new association were discussed and adopted. Mr. N. F. Kingzett, of the Sanitas Co., Ltd., was elected chairman,

Mr. W. H. Hivey, of Taylor's Automatic Disinfectors, Ltd., vice-chairman, and Mr. R. A. Blair, of Burt, Boulton and Haywood, Ltd., honorary treasurer. The Association will be affiliated to the Association of British Chemical Manufacturers, 166, Piccadilly, W.1, which will provide the necessary secretarial and other services. Active endeavours are to be made to secure additional members. Any disinfectant manufacturer, whether individual, firm, or company, operating within the Empire, will be eligible; the subscription of two guineas is such that no firm, however small, should be prevented from joining on the score of expense. The new Association has already taken steps to investigate certain questions of tests which have arisen in connection with the standardisation of disinfectant specifications by a Government Committee.

## A Scientist Misunderstood

HOWEVER many other points may be in doubt in the rather cheap criticism in some of our evening journals of Dr. Robert Millikan's address to the American Association for the Advancement of Science, there is absolute certitude on one. The writers know neither Dr. Millikan himself and his philosophy, nor the spirit of the science that he represents. Those of us who had the privilege to hear his Messel lecture in New York in the autumn of 1928 can easily appreciate his vision of a steadily expanding realm of new knowledge to be turned to the service of mankind, and his looking to science to save the world from war and its future inhabitants from starvation. To associate a thinker of this order with any mechanistic order of existence or of society, to suggest that the progress he seeks is merely progress towards a more perfect human robot, is as stupid as seeing in wireless transmission nothing but a huge technique of valves, condensers, and all the rest, and missing altogether its abolition of distance and its establishment of a new medium of intimate world communion.

No doubt sciences like physics and chemistry have much to do with matter and are materialist in that sense, but to contend that the search for physical truth despiritualises the searcher and his aims is against reason and experience. Great figures in science have generally been among the greatest teachers and prophets of their generation; the scientist that our evening journals have been rebuking is not the scientist at all, but merely the nimble inventor of mechanical gadgets—though even these may mean substantial additions to human comfort. In the case of Dr. Millikan, our friends have picked out the husk and mistaken it for the substance. He was merely stating a commonplace in claiming that every scientific advance finds ten times as many new peaceful and constructive uses as it finds destructive ones.

Explosives and fertilisers, for example, are basically

allied and even explosives find a dozen peaceful uses for one warlike one. Steel, as Dr. Millikan points out, may make bayonets, but it also makes the ploughshares or the surgeon's lancet, the huge bridge or the delicate scientific instrument, the locomotive or the motor car, and endless other things employed in peaceful art and industry. From the chemical laboratory a poison or two may emerge which nobody is compelled to use, but it also produces antiseptics, anaesthetics, substitutes for natural products like insulin, and endless other things that make life more clean and wholesome. It is, in a word, not science that is to blame for any soul-deadening applications of the new knowledge it is constantly bringing to light; the blame must lie, if on anyone, on those who commercially exploit such knowledge in a spirit entirely alien to the original scientific quest after truth for its own sake.

### The B.I.F. Advance Catalogue

A SPECIAL advance overseas edition of the catalogue of the 1930 British Industries Fair, to be opened in London and Birmingham on February 17, is already available seven weeks before the opening of the Fair. It is being issued immediately to 10,000 business men in Europe, North America, South Africa and the Eastern Coast of South America, including all buyers who have notified the Department of Overseas Trade of their intention to attend the Fair. By this arrangement, which has been made possible by the keenness of British manufacturers to participate in the Fair, trade buyers in cities as far apart as Istambul, Capetown, and Vancouver will be able to receive copies of the Fair catalogue before starting on their voyage to England. The catalogue, in addition to descriptive entries of the exhibits of some 1,800 British manufacturers, contains a complete classification of the exhibits by trades, and indexes in nine languages, enabling foreign buyers who are unfamiliar with English to trace the goods in which they are particularly interested.

### Nitrogen Developments

ON February 1, according to present expectations, there will come into operation the scheme whereby certain producers of Chilean nitrate of soda will suspend operations, in order to reduce production. The object of the scheme, which has been sponsored by the Chilean Government, is to reduce production by about 20 per cent. by the voluntary cessation of production in those oficinas where costs are high, and a reduction of 13 per cent. is already certain. In their half-yearly nitrate report, Aikman (London), Ltd. point out that, while "there appears to be no reason to amend the estimated world production of pure nitrogen, July 1929-June 1930, of 2,365,000 tons given previously, a very cursory glance at the situation shows the urgent necessity of a general and substantial restriction in the production of nitrogen, at any rate until such time as consumption can be more closely gauged."

As is well-known, an understanding was arrived at some time ago between the Chilean Government, Imperial Chemical Industries, and the I.G. This, together with recent developments in Chile, shows that the Government is determined to put and keep the natural nitrate

industry on a sound basis. It is of interest, in this connection, that for some time past there have been signs that the position of the I.G. with regard to synthetic production was being threatened by other German concerns. Several of these either have, or shortly will have, plants in production. The situation has now been eased, for it is announced that as the result of negotiations between the I.G., the Deutsche Ammoniak-Verkaufs-Vereinigung G.m.b.H., the Gasverarbeitungsgesellschaft m.b.H., the Ruhrchemie Aktiengesellschaft and the Stickstoffwerk Scholwen, agreement has been arrived at on basic principles. The agreement will run until 1935. The I.G. is to have a quota of 75 per cent. (whether of internal or external trade or both is not stated), the other producers sharing the remainder.

### The Calendar

Jan. 6	Society of Chemical Industry (London Section): "The Micelle Chemistry of Cellulose." C. J. J. Fox. "Meta-filtration." J. A. Pickard. 8 p.m.	Burlington House, Piccadilly, London.
8	Institute of Fuel: "Fuel Economisers with special reference to their Construction, Materials and Recent Developments." O. Kubalek.	Burlington House, Piccadilly, London.
9	Institute of Metals (London Section): "The Aluminium Industry." G. Mortimer. 7.30 p.m.	83, Pall Mall, London.
9	Society of Chemical Industry (Bristol Section): "Wood Distillation." F. G. Conyers. 7.30 p.m.	University, Bristol.
9	Institute of Chemistry (Manchester Section): "The Medical Witness." Dr. R. M. Bronté.	Manchester.
10	Chemical Engineering Group: "Autogenous Welding in Chemical Works." J. R. Boer. 8 p.m.	Burlington House, London.
10	Oil and Colour Chemists' Association (Manchester Section): "Recent Research on Fats bearing upon the Drying of Oils in Paint and Varnish." Professor T. P. Hilditch. 7 p.m.	Milton Hall, Deansgate, Manchester.
10	Society of Chemical Industry (Manchester Section): "Some Aspects of Surface Chemistry and their Industrial Implications." Dr. E. K. Rideal. 7 p.m.	17, Albert Square, Manchester.
13	Institute of Metals (Scottish Section): "Extrusion, and a Consideration of some of the Physical Properties Affecting the Production of Rods, Tubes, and Sections by this Process." A. Wragg. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
14	Institute of Metals (N.E. Coast Section): "Chromium Plating." L. Wright. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
14	Institution of Petroleum Technologists: 5.30 p.m.	John Street, Adelphi, London.
15	Society of Glass Technology.	Sunderland.
15	Institute of Chemistry (London Section): Visit to Laboratories and Bakeries of J. Lyons and Co.	London.
15	Society of Dyers and Colourists (Midlands Section): "Measurement of Fading." Dr. S. G. Barker.	University College, Nottingham.
15	Society of Chemical Industry (Newcastle Section): "Methods of Filtration in Industry." R. D. Burn. 7.30 p.m.	Armstrong College, Newcastle.
16	Chemical Society. 8 p.m.	Burlington House, Piccadilly, London.
16	Institute of Chemistry and Society of Chemical Industry. Open Meeting for Short Papers on Recent Advances, New Apparatus, etc. 7.30 p.m.	36, York Place, Edinburgh.

## Impending Developments in the Fertiliser Industry

By Dr. Emil Collett (Oslo, Norway)

*One of the most important tendencies in the synthetic fertiliser industry, which is showing itself more and more, is the production of complete fertilisers, free from "ballast." In the following article, Dr. Collett elucidates several important points which are now arising in this connection.*

PROGRESS in the production of synthetic fertilisers during the last decade has been such that the development of the industry has been followed with interest not only by chemists, but also to a considerable extent by the public. This interest has, until the present time, been especially directed to the production of nitrogen products, and first of all to the synthetic industry.

In addition to nitrogen (contained in Chilean nitrate, nitrate of lime, ammonium sulphate, etc.), potash and phosphoric acid (potash salts, superphosphate, basic slag, etc.) are also of the highest importance, and of late a development in the domain of these products has also been noticeable, and in such a way so as to indicate that we are on the verge of a turn in the fertiliser industry.

### Activities of the Wintershall Group

In Great Britain an interesting patent application was recently published by a firm adherent to the Wintershall group in Germany. The process in question deals with the dissolution of phosphate rock through nitric acid in the presence of potassium sulphate under special conditions.

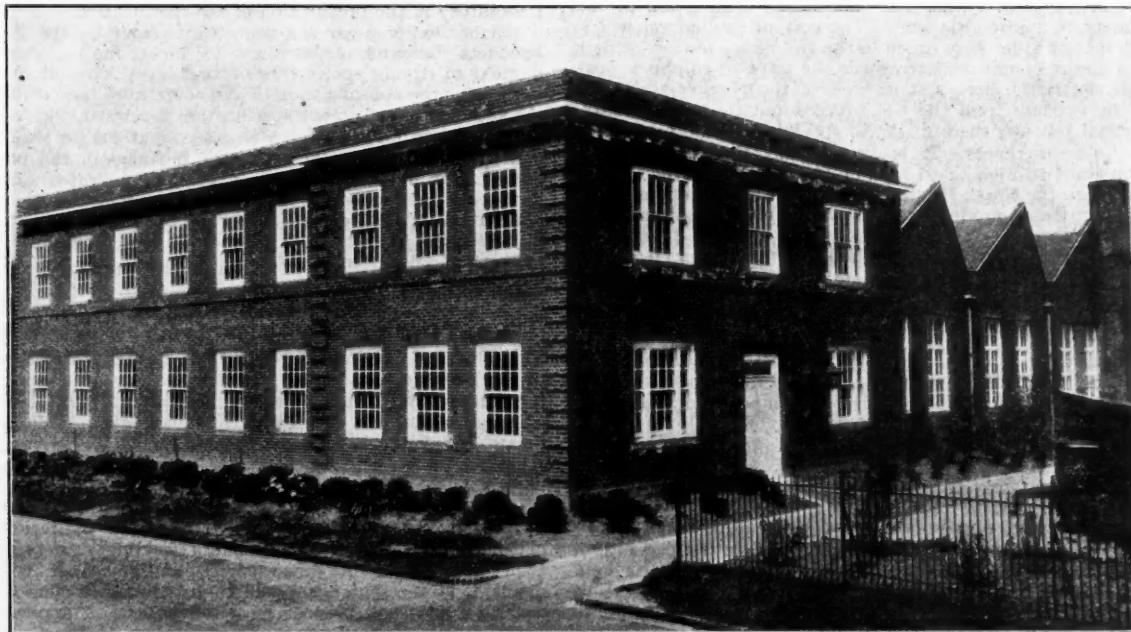
There are others who have also carried out work in the same field; but when the Wintershall group begins to deal with the production of mixed fertilisers—and from several recent reports this seems to be the case—this fact deserves special attention. Therefore it seems worth while to examine shortly the prevailing conditions for the production of these substances, and the prospects they hold out from a chemical and technical viewpoint. Whether or not in future production will be based exactly upon the above-mentioned patented process is of secondary importance. The point is that the most important of the German potash groups has apparently realised the possibilities of its future development.

In mixed fertilisers the principal constituents are potassium, nitrogen, and phosphoric acid. A complete fertiliser contains all of these three constituents, but other mixed fertilisers may only contain two of them. Whereas in former times, to a considerable extent even now, the single fertilisers (potash salts, nitrate of soda, sulphate of ammonia, superphosphate, etc.) were simply mixed to produce the complete fertilisers, which contained large amounts of "ballast" substances such as chlorine, sulphate ion, sodium, etc.; in recent years producers have begun to manufacture fertilisers in which both the base and the acid part of the salt represent fertilising factors. Such salts are, for example, ammonium phosphate, potassium nitrate, potassium phosphate and others, containing each of them two fertilising constituents.

These compounds represent the most highly concentrated fertilisers that can be produced, and they do not contain any substance that is harmful to the soil or vegetation. A suitable mixture of such compounds in a suitable form will give a complete fertiliser of the same characteristics as the salts.

The packing and handling of fertilisers, and their transport to home and foreign markets, have a great influence on the prices at which they can be offered to consumers. A development in the production of high-grade fertilisers would therefore be welcomed. This development has hitherto been limited, partly on account of the conservatism of many agriculturists, and partly because the fertiliser manufacturers, in many cases, have not had at hand the right conditions for the production of the high-grade products. If the production of the concentrated mixed fertilisers is to be adopted by the potash-producing group, as mentioned above, this decision must certainly have been preceded by a thorough investigation of the situation, establishing the fact that in the group's opinion

## The Chemical Research Laboratory, Teddington



A GOOD PHOTOGRAPH OF THE CHEMICAL RESEARCH LABORATORY, TEDDINGTON, SENT OUT AT CHRISTMAS "WITH SEASONAL GREETINGS FROM THE DIRECTOR AND STAFF."



the right conditions are at hand. If this opinion is well founded, a very interesting situation arises.

#### The Potash Question

Until lately there has been in Germany one large group producing mixed fertilisers, and the pioneering and successful work of this group is too well known to need comment. With this group, the central point is the transformation of atmospheric nitrogen into marketable fertilisers, and upon this the manufacture of complete fertilisers has been based and developed. But this basis, after all, is practically available to everybody having sufficient capital and cheap energy sources, hydraulic or thermic (coal), because these are, broadly speaking, the only conditions necessary for the production of cheap ammonia, which to-day represents the first step in the production of the large majority of synthetic nitrogenous fertilisers.

The situation of the Wintershall potash group is essentially another one. Of the three main fertilising needs, nitrogen, phosphoric acid and potassium, the group has a large basis of potash at its disposal, which places it in an advantageous position with regard to the production of mixed fertilisers, as compared with other producers of such substances, inasmuch as the latter have as a basis only atmospheric nitrogen. The Wintershall group, together with the Klöckner works (great producers of coal and coke in the Ruhr district), have now established ammonia plants of their own. The outstanding problem to-day, however, is no longer the manufacture of ammonia, but its transformation into marketable products, and especially the combination of the fixed nitrogen with potash and phosphoric acid.

#### Phosphoric Acid

The Wintershall group has thus nitrogen and potash at hand under favourable conditions. Regarding the third necessity, phosphoric acid, none of the producers of complete fertilisers, at least in Germany, has a preference over others, as the phosphate rock must in any case be supplied from overseas.

The phosphoric acid of the imported phosphate rock (tricalcium phosphate) must be separated from the calcium. This separation can be carried out, principally, in two different ways: according to the wet process, by which the calcium, by means of sulphuric acid, is separated in the form of calcium sulphate; or by the thermal process (the heat source being electricity or fuel), by reduction of the phosphoric acid to elementary phosphorus, and subsequent combustion of this element to phosphoric acid. The cost of production will in general not differ very much in the two cases, but on account of differing conditions as regards the price of sulphuric acid, fuel, electricity, etc., and in view of the possible utilisation of the gypsum from the wet process and the slag from the thermal process, there might in special circumstances be remarkable differences. It is known that the I.G. produces complete fertilisers based both on the wet and on the thermal basis, and the Norsk Hydro concern some time ago announced its intention of producing thermal phosphoric acid and complete fertilisers.

What will be the position of the Wintershall group regarding the treatment of phosphate rock? It is possible, from the above-mentioned patent application and from other publications, to draw interesting conclusions in this connection. It is known that the group has worked out a new process for the treatment of certain crude potash salts containing potassium chloride which, through a double decomposition with magnesium sulphate, is transformed into potassium sulphate, there being various marketable by-products, and it is said that the cost of production of the potassium sulphate by this process is very low.

#### Treatment of Phosphate Rock

The treatment of the phosphate rock seems to be the following: The rock is treated with nitric acid in the presence of potassium sulphate (produced as above). The nitric acid dissolves the tricalcium phosphate, and owing to the presence of potassium sulphate there will be formed calcium sulphate and potassium nitrate. The calcium sulphate is precipitated and separated from the liquid, which contains potassium nitrate and free phosphoric acid, which latter may, by the addition of ammonia, be transformed into ammonium phos-

phate. The final products from these reactions will then be potassium nitrate and ammonium phosphate. These two salts may be separated, or worked up in combination so as to form complete fertilisers of the highest degree of concentration. The calcium sulphate, if necessary, can be transformed into ammonium sulphate by means of ammonia and carbon dioxide, and the resulting calcium carbonate, by treatment with nitric acid, into nitrate of lime.

If the necessary potassium sulphate can be obtained at a really low price, and the above reactions take place easily and with good yields, the described procedure seems to be ideal.

#### Other Wintershall Activities

It is furthermore reported that the Wintershall group has developed continuous processes related to that described above, in such a way that it will be possible, through the sulphuric acid contained in the crude salts, to transform practically unlimited amounts of phosphate rock into water-soluble form. The group is also working on the production of potassium carbonate, with the hope of lowering the cost of this product. Should they succeed, it will be of the highest importance for the production of substances such as potassium nitrate and potassium phosphate, which may in the future both play great parts in the fertiliser industry.

It appears, therefore, that the Wintershall group are in an important position with regard to the production of complete, "ballast-free" fertilisers, and the importance of this fact cannot be overestimated. It may, in fact, be expected that the centre of gravity of complete fertiliser production will be gradually removed from a nitrogen to a potash basis.

### New British Standard Specification

#### Method of Testing Small Clear Specimens of Timber

THE British Engineering Standards Association has just published a British Standard Specification for Methods of Testing Small Clear Specimens of Timber, No. 373—1929, for the purpose of comparing the mechanical properties of one species of timber with another. The specification covers the standard methods for carrying out the following tests: Moisture content, compression, static bending, impact hardness, cleavage, shear tension, specific gravity and shrinkage, and includes a table showing the tests recommended to indicate the suitability of timber for specific uses. The Association has worked in close touch with the Forests Products Research Laboratory in the preparation of the specification.

Further experiments are being carried out by the Forests Products Research Laboratory to determine a standard method of drying specimens of timber, which will be submitted for the consideration of the committee responsible for the specification when the specification is revised, with a view to drawing up more comparable determinations for shrinkage and specific gravity. The methods included in the present specification have been, however, generally adopted, and are producing useful results. Copies of the specification may be obtained from the British Engineering Standards Association, Publications Department, 28, Victoria Street, London, S.W.1, price 2s. 2d., post free.

#### Next Meeting of Chemical Engineering Group

THE Chemical Engineering Group will hold its first meeting of the New Year on Friday, January 10, 1930, at 8 p.m., in the rooms of the Chemical Society, Burlington House, London. The chairman of the group, Mr. H. Talbot, will preside, and a paper on "Autogenous Welding in Chemical Works" will be presented by Mr. J. R. Booer. The author will deal with the theoretical and practical considerations governing oxy-acetylene and arc welding in industrial metals; the properties of welded joints and their possibilities and limitations in chemical engineering; and modern welding processes and their application. Advance copies of the paper will be available in due course, and will be distributed to members as usual. Copies will be sent to non-members on application. Prior to the paper, dinner will be taken at the Criterion Restaurant (West Room), Piccadilly Circus, London, W.1, at 6.45 p.m. All members are invited to take part, the cost per head, exclusive of wines, being 6s.



## Research and Industry

By W. P. Dreaper, O.B.E., F.I.C.

THE amount of money spent by certain leading industrial concerns on private research is realised by few. In some cases not less than £100,000 per year is being spent. A mere examination of the number of patents applied for by some firms is sufficient to confirm this.

### Industrial Research Stations

Many industries in this country now run a common research station or laboratory, this development having been hastened by post-war conditions and the advertisement given to science during the war.

As far back as 1909, the writer strongly advocated in a lecture the "setting up of central trade laboratories or stations to deal with the pressing need for research." Also that the colleges on their part must "institute a system of research training for their students" (*Times* report, March 18, 1909). This lecture, delivered at Bradford, received general Press notice, one leading paper referring to it as "a matter of grave industrial and national import."

In 1915, the writer, while acting as consulting chemist to the Silk Association, submitted to that body the first scheme of collective research in a memorandum published in their annual report for that year (No. 31, pp. 18 to 21). This scheme came into operation in due course, and was the first of its kind in this country. It was supported financially by members of the Association, and also received the first Government grant for this kind of work.

### First Trade Research Scheme

The main features of this scheme included the following items: The setting up of chemical and physical standards for natural silk; the study of certain problems connected with the silk fibre, "which from their general nature can best be investigated on broad lines, which work from its nature may naturally be regarded as falling outside the general work of the consulting chemist or the works chemist." The programme of research at this early stage of development also included the influence of light and storage on weighted silk, the general conditions involved in the correct removal of silk gum from raw silk, modifications in the testing of raw silk, etc.

The general conditions governing this first research scheme were considered to involve (1) the necessary financial and general co-operation of those interested in this matter, both directly and indirectly; (2) the initiation of research which should comply with the above-mentioned conditions; (3) the publication of the results obtained in an easily accessible form; and (4) the publication of a series of text-books dealing with the different sections of the silk industry.

Finally, the Council passed a resolution "That the Association communicate with the Government Committee of Scientists (the then recently formed Scientific Advisory Council) and urge the need for a scientific research on the subject of silk on the lines suggested in Mr. Dreaper's letter." Thus came into being the first research station of its kind.

### Extension of the General Scheme

Many trades subsequently followed suit, such as those dealing with the manufacture of cast iron, cocoa and allied industries, food manufacture, the cotton industry, the laundries, the leather manufacturers, non-ferrous metals, linen, photographic materials, refractories, rubber, shale oil, woollen and worsted materials, and flour.

All of these can be regarded as performing important functions in their respective industries, and they are all, I believe, receiving Government grants.

### Colleges and Research Training

Simultaneously with the suggestion for the setting up of trade research stations, the writer also suggested that our science colleges must give their students definite instruction in the methods of carrying out research—not to a few selected last year students, but to all. The scheme I then suggested for carrying this into effect was summarised as follows (*Textile Manufacturer*, May 15, 1909):—(1) A research board to be founded in every college of repute, consisting of the professors and demonstrators, with possibly a few old students acting as honorary members; (2) men who have passed through the college course, or others under certain conditions, would be invited to submit ideas suitable for research, suggested to them

in the course of their work, but which they could not carry out themselves; (3) the board would then instruct a senior student or students, and would put them in touch with the outside man through the board. The students would then commence research on this special subject, carrying out the experimental part under the direction of the college staff under certain specified conditions; (4) the results, if considered satisfactory, would be published under the joint names of the suggestor and the student from the college address; (5) for the benefit of the general students, research meetings would be held in class under the professor, where the aims of the research would be indicated. Thus the technical man might find a partner, the staff control would guarantee the quality of the work, and the research board would be a connecting link between the student and the technical expert. The *Textile Manufacturer* remarked that "with such a combination there is no doubt that much good work could be accomplished and many useful reforms instituted in industry."

### Research in Class

Subsequently in *Nature* (April 1, 1909) a further development was suggested: "The senior students, divided into groups of, say, four, would engage in some well-recognised research of a classic nature from the published work in this direction. . . . The difficulties met with by the original investigator would come to the surface and be followed step by step by the students. The different groups in class would at intervals examine each section's work and be instructed generally in the same by the staff. A careful selection might cover research in pure chemistry and technical research as well."

In 1910, I urged that "the Government should offer the price of one torpedo boat in research scholarships, so that our chemists might have the chance of at least five years' training and an insight into industrial research as well." In the *Times* (February 23, 1910) it was pointed out that "there were probably others like myself, who have offered subject matter for such research and have been informed that there were no facilities for dealing with such outside suggestions." Further details were given in *Nature* (November 17, 1910), and more general particulars in the *Yorkshire Observer* (November 21 and December 21, 1910).

I suppose it is still doubtful whether sufficient facilities exist in many of our colleges for research training for the students. Yet it is quite clear that the average student enters a college to secure a groundwork of knowledge and experience which will fit in with his future work in the industrial world.

It is understood that there is a general consensus of opinion that a great deal of the research published to-day is far too mechanical and unimaginative. There are many, I suppose, whose ideas concerning examinations do not agree with the suggestion that they "lose their chief value when they fail to supply the student with an estimate of the value of his personal qualifications, enabling him to confirm his original intention, or change the direction of his life's work while there is still time." Were each student given an insight into research conditions as he will certainly have to obtain when he leaves college, he would have his actual position clearly defined for him on each day of his training. He would then realise that his imagination must be kept in curb until he possessed technical skill, and the knowledge how this can be most easily utilised.

Although the research stations give the junior members on their staffs a very good realisation of the conditions which must apply to industrial or economic research, there is still room for material improvement in many colleges.

## I.C.I. Headquarters Medical Department

### Northwich Doctor Appointed Chief

ACCORDING to the *Stafford Sentinel*, Imperial Chemical Industries have created a new headquarters medical department, and have appointed Dr. T. E. A. Stowell, of Northwich, head of the department. In conjunction with his private practice, Dr. Stowell has been works doctor at the Winnington works of Brunner, Mond and Co. for the past 17 years. His new appointment will necessitate his removal to London. The doctor is honorary surgeon to the Mid-Cheshire Orthopaedic clinic, which he was instrumental in founding for the treatment of disabled soldiers. Since the war it has offered facilities to a large number of children and private patients for electrical treatment.

## Damage to Paintings by Mould

### Problem Solved by Chemical Means

*The following notes, received from Cooper Union, New York, describe a successful attempt to treat mould on paintings by a process evolved by a group of American and British chemists.*

EFFORTS of American chemists to save from destruction by mould the only official records of the construction period of the Panama Canal, a series of five mural paintings in the Administration Building at Balboa, have been successful, it is announced by W. B. Van Ingen, instructor in the Art School of Cooper Union, who supervised the treatment of the pictures.

#### The Problem

When the presence of mould, the gangrene of paintings, became apparent on the pictures last year, Mr. Van Ingen, who painted the series at the request of Colonel G. R. Goethals, builder of the Canal, was commissioned by Colonel Harry Burgess, Governor of the Canal Zone, to undertake the restoration of his paintings. Because the pictures, which cover an area of about 400 square feet, are permanently secured to the walls of the Administration Building and could not be removed for laboratory treatment, the problem of killing the fungi on them baffled the experts on mould of the Smithsonian Institution, the Metropolitan Museum of Art in New York, the Brooklyn Museum, and authorities from other leading institutions, who were consulted.

The treatment finally used was devised by Professor Albert B. Newman, Director of the Department of Chemical Engineering at Cooper Union, with the co-operation of Dr. Charles Thom, chief mycologist of the Bureau of Chemistry and Soils of the Department of Agriculture; Dr. Alexander Scott, of the British Museum, and others.

Previous to the application of Dr. Newman's treatment, Mr. Van Ingen had made a personal inspection of the condition of his paintings. Clusters of green and white mould resembling damp talcum powder had spread over the pictures, and the minute fungi had apparently eaten the paint down to the canvas in some spots. Photographs of the affected paintings taken at close range indicated the havoc wrought by the mould.

Mr. Van Ingen's pictures show features of the actual construction of the canal which are now hidden by 50 ft. of water. Four of the paintings depict respectively the Miraflores Locks, Culebra Cut, a spillway and a pair of locks as they were nearing completion. The fifth picture is a ninety-foot frieze circling the rotunda of the Administration Building below the other pieces in the group.

#### Usual Methods Impossible

The task of killing the fungi which had collected on the pictures during fifteen years in the tropical climate of Panama presented difficulties which had never been encountered by mould experts accustomed to working on relatively small pictures and in a laboratory equipped for the purpose.

It was impossible to move the pictures, which were fastened to cement walls with 800 lb. of white lead, and the circular walls of the rotunda, which the paintings adorned, made the construction of a fumigation chamber practically impossible. The rotunda serves as an entrance to offices used by hundreds of persons daily for official business, a condition which made fumigation for the necessary period of time impossible. Furthermore, mould experts connected with the leading collections of paintings in the United States had had no experience with the paint problem as encountered in the tropics. It was an entirely new problem, and it had to be solved by new methods.

There are four steps in Professor Newman's treatment, which was used with complete success. The porous beeswax which Mr. Van Ingen had used to cover his paintings was removed by alternate washing with turpentine and alcohol. A liquid fungicide made by dissolving thymol, a powerful mould antiseptic developed by Dr. Scott, of the British Museum, in alcohol, removed the necessity of using a vaporised disinfectant. Extensive previous tests had proved that a solution of thymol was as effective in killing the deep-seated spores of the mould, which are a more serious menace than the apparent mildew on the surface of the paintings, as the thymol vapour used in the laboratory. The dead fungi were removed by washing with ammonia, and the paintings were ready for the protection provided against future depredations from the vegetable growths which flourish in warm moist climates.

The safeguard provided was a thin coat of paraffin spread across the surface of the pictures by dissolving the wax-like substance in a solvent which later evaporated. Thymol was mixed with the paraffin to subject the seeds of the mould, which are constantly floating in the air, to its effects in the future.

Temperature records taken over a period of ten years in the rotunda of the Administration Building were used to determine the mixture of ingredients which would give to the paraffin film the proper consistency. This procedure was necessary to satisfy the engineers of the Canal Zone, who objected to the use of paraffin on account of its low melting point.

#### Applying the Remedy

"The application of the treatment in the Canal Zone was simplicity personified," Mr. Van Ingen states. "The paintings were first washed with saponin to remove all superficial dirt, the varnish was removed by alternate washings with alcohol and turpentine, a 5 per cent. solution of thymol was applied, and as a safeguard in the future a final coating of paraffin containing 2 per cent. of thymol was spread over the surface of the pictures."

"When I left Panama the paintings appeared as though they had been executed the day before, and there had not been applied a brushful of paint to them since 1915. Photographs taken of the pictures before the removal of the fungi showed clearly that the mould had eaten through to the canvas in some spots. I expected that I should have to do considerable retouching after the growths had been removed, and, accordingly, carried a whole bag of paints with me to Panama. But I did not have to use them. For some mysterious reason, the paint was clear and fresh after the thymol treatment on the very spots where the canvas had clearly shown through in the photographs. It is inexplicable, but entirely satisfactory to all concerned."

#### Wider Applications

Mr. Van Ingen adds that the successful use of thymol by the artist suggested its extension to other fields, especially in the tropics. "Mould is a constant menace in Panama," he states. "Every family of the better class in the Canal Zone finds a 'dry closet' indispensable. White shoes, linens, in fact anything offering nourishment to the ubiquitous seeds of the fungi, are covered with thick mildew if left unprotected overnight. Until to-day the only protection used has been the 'dry closet,' which is nothing more than an ordinary closet which is kept dry by a powerful electric lamp. But our investigations have indicated that the question of mould can be handled as effectively as the mosquito menace. The method we used on paintings should work as well on shoes. It is not improbable that our experience with thymol will encourage the canal engineers to remove the ravages of mould as a deterrent to life in Panama."

Paraffin was used as a protection against mould because of its impurity and transparency. Its use was suggested by the experience of New York City engineers, who made an extensive examination of the obelisk in Central Park to determine how it could be protected from the city climate. A barrel of flakes from the stone of the obelisk had collected at the base of it, and the monument had begun to show the effects of its deterioration. The shaft was impregnated with a coat of paraffin, on the recommendation of the engineers who investigated its condition, and, since the treatment in 1890, has shown little evidence of crumbling.

Mr. Van Ingen states that the thin film of paraffin covering his pictures will remain unchanged indefinitely, and will prove an absolute protection against the effects of exposure to the tropical climate as long as it exists.

Among the experts who assisted Mr. Van Ingen and Professor Newman, in addition to Dr. Thom and Dr. Scott, were Dr. Lewis T. Bates, chief of the laboratories of the Health Department of Panama, who supplied the cultures of the mould taken from various parts of the pictures which were used in finding an effective fungicide; Dr. Bernard O. Dodge, plant pathologist of the New York Botanical Garden, where important research in this field is in progress; Dr.

Charles F. McCoombs, of the New York Public Library; Mr. T. R. Beaufort, a professional picture restorer; Dr. Leslie Ewart Morris, of the British Cotton Research Association; Mr. George Smith, an English scientist; and Mr. Hugh L. Robinson, editor of the *Journal of the Textile Institute of Manchester*. Colonel Lucien L. Schley, the Engineer of Maintenance of the Panama Canal, and the chemists on his staff co-operated with Mr. Van Ingen while he studied the situation in Panama.

## Ontario Research Laboratories

### Nearly Four Million Dollars Subscribed

THE Prime Minister of Ontario recently laid the foundation stone of the new laboratory building established by the Ontario Research Foundation in Queen's Park, Toronto. The Ontario Research Foundation, which has been established to provide facilities for the investigation of problems concerning agricultural, industrial, mining and forest industries in that Province, has now accumulated funds aggregating about \$4,000,000. Subscriptions from private individuals and organisations amount to \$1,860,000, and as the Provincial Government has offered to subscribe one dollar for every dollar raised by the public, the Legislature has authorised the appropriation of \$2,000,000, which will be handed over as soon as the remaining \$140,000 comes in from private individuals. The control of expenditure will be in the hands of the directors of the Foundation.

The Government is hopeful that the Ontario Research Foundation will be able to demonstrate the possibilities of the "sponge iron" produced from the huge quantities of low-grade ores available in the Province, but which have not yet been exploited, owing to the competition of imported high-grade ore from Minnesota.

The chairman of the council of the Ontario Research Foundation is Sir Joseph Flavell, Dr. Horace B. Speakman being Director of Research. The entire faculty of the Foundation has been recruited from Canadian Universities, with the exception of two members from British institutions. Dr. Speakman first went to Canada in connection with products not manufactured in the Dominion and needed by the British Ministry of Munitions. He has recently been released by the University of Toronto, where he was Associate-Professor of Biochemistry, for the benefit of research work in Toronto. He is a graduate of the University of Manchester.

## Australian Tariff: Strong F.B.I. Resolution

THE following resolution was passed by the overseas committee of the F.B.I. with regard to the recent Australian tariff increases. It is of considerable importance as representing the view which is held of the Commonwealth Government's action: "The overseas committee note with profound regret the recent heavy increases in the Australian tariff, which will have a twofold adverse effect upon the reciprocal trade between Great Britain and Australia, which is so important to both parties; firstly by impeding the sale of British goods in Australia to the detriment of the British manufacturer and with the further effect of rendering this country less capable of purchasing Australian products; and secondly, by still further increasing the economic difficulties of Australia, thus rendering it more difficult for her to obtain as freely as in the past the necessary financial means for her development. The committee consider, moreover, that the resulting conditions in Australia, namely, high cost of living, difficulties in finance and high production costs, will in future discourage British manufacturers from establishing industries in the Commonwealth."

## Safeguarding Act Application: Zirconium Oxide

A REPRESENTATION has been made to the Board of Trade under Section 10 (5) of the Finance Act, 1926, regarding zirconium oxide. Section 10 (5) of the Finance Act, 1926, deals with exemptions from duty. Any communication should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, London, S.W.1, within one month from the date of this notice. (December 23, 1929.)

## Rationalising the Chemist

To the Editor of THE CHEMICAL AGE.

SIR,—I think everyone will welcome your editorial of December 14. Dr. Ormandy's address and that of our President, Mr. Scholefield, each in its own way emphasised very tellingly the unsatisfactory state of organisation in the profession at the present time.

There are, as your editorial implies, two sides to this question, that of organisation for administrative purposes, and that which would be most satisfactory from the point of view of publishing activities. With the latter the British Association of Chemists is not greatly concerned, but with the former the question of unification arises in another connection. The possibility of one great merger is at present certainly remote, and it is doubtful even if it is desirable. Co-ordination, however, without amalgamation, ought to be possible, and this would go a long way to removing some of the most obvious difficulties. There is at present no real contact between any one society and another. They stand as separate entities, very jealous of their privileges and supposed rights, and no real connecting link exists between them. Their publishing activities, in consequence, overlap, and their policies, in the case of those that have any.

This question of policy is a most important one and really the crux of the whole question. A society which has a policy and an end in view will organise in an endeavour to further that policy and will endeavour either to crush those who are opposed to it or to come to terms with them. That is the whole secret of rationalisation in politics, industry, or science. A society engaged in publishing activities only has not a policy, and no society thus uniquely engaged has any right to the name; it is nothing more than a publishing house. It is impossible, for example, to further pure and applied chemistry merely by reading and publishing scientific papers. Chemistry is now too closely associated with everyday life for that. Times are changing and science is no longer for the scientific man alone. There are obvious possibilities in this direction for the development of a definite policy by these societies which at present cannot be said to possess one.

If every chemical society developed a policy we should hear less of imperfect organisation. With really large aims in view the organisation of the societies would advance. There would be disagreements, no doubt, but all would be striving to discover, and would discover, common ground. It is the disagreement about nothing which cannot be healed. The preliminary form that rationalising the chemist could take would be the formation of a General Chemical Council which would co-ordinate the work of the societies composing it. The formation of such a council will only be possible when each society is really agreed about what it wants to do, and how it proposes to do it. Such a situation would present new difficulties, but they would be ones that could be defined and therefore resolved.—I am, etc.,

HENRY T. F. RHODES,  
Editor, *The Chemical Practitioner*.

British Association of Chemists,  
Empire House,  
175, Piccadilly,  
London, W.1.

## Income Tax Problems

To the Editor of THE CHEMICAL AGE.

SIR,—It is possible that a number of your readers will be interested in a decision which has just been made by the Inland Revenue Department that recipients of preference shares issued in settlement of interest arrears by the Mexican Light and Power Co., Ltd., are not liable to income tax thereon. In cases where the tax has already been paid it will be possible to obtain refunds.

The point is an illustration of the difficulties which confront the taxpayer in attempting to secure the correct adjustment of his assessments, and suggests the advisability of a reminder that other somewhat obscure allowances are claimable, such as losses in farming, cost of maintaining property, housekeepers, bank and building society interest, cost of renewing shop front, to name only a few.—Yours,

W. R. FAIRBROTHER.

67-68, Cheapside,  
London, E.C.2.



## New Year Calendars and Greetings, etc.

AMONG the numerous greetings, calendars, etc., received by THE CHEMICAL AGE, the following are acknowledged with the Editor's compliments and good wishes:—

From the Barter Trading Corporation of London, of which Sir William Alexander, M.P., is the head, comes a very neat gold pocket pencil, of the Eversharp type, with the company's initials stamped on the head, an attractive and useful seasonal gift that serves as a pleasant reminder of the company.

The pocket card case and diary issued by the dyestuffs group of Imperial Chemical Industries, Ltd., adheres in style to that formerly issued by the B.D.C. In addition to the ordinary diary and calendar, it contains a quantity of technical and commercial information relating to the dyestuffs industry and makes a welcome present.

The A.B.C.M. "Who's Who," issued by the Association of British Chemical Manufacturers, is a convenient vest pocket guide to the officials and associations included in this comprehensive organisation. The names and addresses of the constituent firms, in so convenient a form, are particularly useful for reference.

The Scientists' Reference Book and Diary for 1930, issued by the well-known firm of Jas. Woolley Sons and Co., Ltd., Manchester, is one of the best and most complete publications of the kind that we know. Its style remains unchanged, for the excellent reason that it would be difficult to improve on it, but the reference section, a miniature encyclopædia of scientific facts and information, grows in completeness every year. The firm are to be congratulated on so excellent a production.

The Clayton Aniline Co., Ltd., of Clayton, Manchester, issue as a wall calendar a beautiful collotype reproduction of the painting by S. Lewin, "The Duel." The subject is well chosen to illustrate the use and charm of colour, and makes an agreeable reminder of our debt to those who supply dyestuffs for commercial and art purposes.

One of the most interesting greetings takes the form of an excellent photograph (reproduced on p. 3) of the Chemical Research Laboratory, Teddington, sent out "with seasonal greetings from the Director and Staff." The growth of the laboratory is illustrated by the present size of the building, and the founders have wisely reserved ample space for the further extensions that are sure to follow.

The Staveley Coal and Iron Co., Ltd., of Chesterfield, send a handsome leather-bound pocket-book, diary and compendium of chemical information. The chemical portion of the book contains a large number of useful constants and data, together with numerous blank leaves for notes.

The Director and Staff of the Government Soap Factory of Bangalore, India, forward for the third year a beautiful album, with reproductions in colours of twelve paintings, illustrating phases of Indian life, by well-known Bengalese artists. Acknowledgment is made to friends across the sea of the favourable opinions expressed through Mr. S. G. Sastry, officer in charge of the Mysore Government Soap Factory, who evolved the idea of presenting an album last year as a Christmas gift to his clients. It is added that the idea has proved of great benefit in the matter of publicity and in financial results. Apart from the artistic charm of these reproductions, there is an interest in the descriptive text, in English and the native language, and in the local atmosphere which both combine so happily to reproduce.

Among the flat tablet diaries for the desk may be mentioned the Blythwood Ring Tablet Diary for 1930-31, with space for appointments for fifteen months, issued by the Anglo Scottish Chemical Co., Ltd., of Glasgow, and a similar production sent by the Lea Recorder Co., Ltd., of 28, Deansgate, Manchester. Wall calendars have also been received from Crossley Brothers, Ltd., the well known makers of power engines, of Openshaw, Manchester; Crofts (Engineers) Ltd., Bradford; Le Grand, Sutcliffe and Gell, Ltd., Southall, London; Carter-Davis, Ltd., 54-58, Queen Elizabeth Street, London; and the Cambrian Wagon Co., Ltd., East Moors Road, Cardiff. Thomas Broadbent and Sons, Ltd., Huddersfield, issue a very neat packet of loose-leaf memoranda sheets for the vest pocket.

Further contributions have been received from the Premier Filter Press Co., Finsbury Pavement House, London (refills for their desk calendar and a miniature pocket diary), Carty and Son, Ltd., vat and tank makers, Peckham, and Cameron, Warnock and Co., Glasgow (desk engagement diaries).

## A Picture called "The Laboratory"

### An Unfounded Faraday Tradition

THE Chemists' Club, New York, has a picture, now hanging in the library, presented many years ago by the late Charles F. Chandler, who purchased it in England. It has always been the tradition that the picture represents Michael Faraday washing laboratory apparatus for Sir Humphrey Davy. Like so many traditions, this one, too, proves to be an idle dream. Here is the story as told by Dr. Arthur D. Little and published in *The Perculator*, the Club journal:—

"It happened that Dr. Francis H. Carr came to my laboratory when in this country a year ago. He then expressed doubt concerning the legend of the picture and later went to great pains to get the authentic story, which I now send you on the enclosed sheet. I am darn sorry he did it, for I hate to see a pretty tradition shattered, but in the interests of truth, for which we chemists entertain such scrupulous respect, I send the story on to you. While I was in London I was taken over the Royal Institution and down into Faraday's laboratory. I found as a matter of fact that it bore no resemblance to the picture and was lighted only by a large window facing a whitewashed brick wall only a few feet away."

Dr. Carr, in a note on the engraving of the picture by W. Hunt, entitled "The Laboratory," states:—

"This depicts the premises of Jacob Bell in Oxford Street (London). Beyond the laboratory is the shop, and through the entrance door of the shop may be seen Great Portland Street. An account of the picture is given in *The Chemist and Druggist* for July 30, 1898, according to which the old man in the engraving was John Simmonds, who was a shopman to John Bell in 1806. He remained with the firm until a hoary old age, to be immortalised in Hunt's water colour drawing of 'The Laboratory.' The name of the boy was William. There seems little reason to believe the truth of the allegation that the picture depicts Michael Faraday washing apparatus for Sir Humphrey Davy."

### Coal Tar Products from Canada and Australia

DURING the first half of 1929, Canada exported 147,221 imperial gallons of coal tar and pitch, valued at \$13,096, and 537,200 imperial gallons of creosote oil, valued at \$85,102, to the United States, the comparative shipments during the first half of 1928 having been 219,392 imperial gallons of coal tar and pitch, value \$15,592, and 636,222 imperial gallons of creosote oil, value \$104,537. Declared exports of creosote oil from Sydney, Nova Scotia, to the United States had an aggregate value of \$70,084 for the first half of 1929 as compared with \$55,394 for the first half of 1928.

It is reported that the New South Wales Coal Commission will investigate the utilisation of Australian coal in the manufacture of coal by-products, especially in regard to motor spirit and residual oils. It is estimated that the amount of vertical retort tar recovered by gas companies amounts annually to between 23,000,000 and 27,000,000 gallons; the amount of by-product coke-oven tar at 3,500,000 gallons, and the amount of horizontal retort tar, recovered by old type gas plants in the smaller towns, at 500,000 gallons. By-product coke ovens have a benzol recovery plant, and produce in the neighbourhood of 1,250,000 gallons annually.

### Chlorine Consumption in Russia

ACCORDING to a recent issue of the Soviet official journal, *Aviation and Chemistry*, the U.S.S.R. is anxious to increase the use of chlorine. Attention is directed to the various outlets for this commodity, for example, the greater use of chlorine in the Russian flax industry. At present an important part of the flax grown in the country is spun and woven by the peasants themselves, all bleaching being done in the sun and entirely without the use of chemicals. Chlorine is used for water disinfection in only two or three municipalities in all of Russia. The consumption of chlorine by the various branches of the Russian state industry is given as follows:

	Percentage of the Total Consumption.		Percentage of the Total Consumption.
Paper .....	36.2	Municipalities .....	3.5
Textile .....	23.0	Agriculture .....	2.7
Aniline dyestuff .....	14.3	Transportation .....	10.0
Pharmaceuticals.....	5.7	Sundry .....	4.6

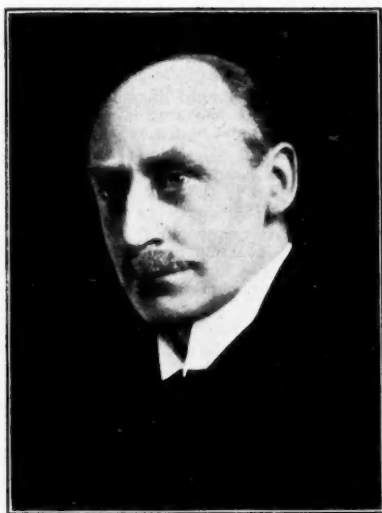
### The Honours List

THE New Year Honours List includes the following:—

A BARONY.—Sir Charles Cheers Wakefield, Lord Mayor of London in 1915, founder of the firm of C. C. Wakefield and Co., Ltd., manufacturers of lubricating oils.

A KNIGHTHOOD.—Mr. G. W. Paton, chairman of the British Match Corporation, and of Bryant and May, Ltd.

C.B.E.—Professor J. S. S. Brame, F.I.C., Professor of Chemistry and Metallurgy at the Royal Naval College, Greenwich. Educated at the Royal College of Science, Professor Brame became demonstrator at the Royal Naval College in



PROFESSOR J. S. S. BRAME.

1897, instructor in 1910, and Professor in 1914. In the period 1921–23 he was President of the Institution of Petroleum Technologists. He has published papers and books on fuel and combustion, including contributions to the *Journal of the Chemical Society*, the *Journal of the Society of Chemical Industry*, etc.

### Chemical Matters in Parliament

#### Diseases from Paint-Spraying

Mr. Sorensen asked the Home Secretary (House of Commons, December 19) whether he was aware of the harmful effects of paint-spraying, both on the operators of machines for that purpose and also on others working in the vicinity of the operation; and whether he would consider introducing legislation for the purpose of safeguarding the health of such workers?

Mr. Short, in reply, said that paint-spraying was not necessarily harmful—it depended on the nature of the paint and the circumstances in which it was used, and so far as the Department was aware, any cases where there was risk to health could be, and were being, effectively dealt with under the powers conferred by the Factory and Lead Paint Acts.

#### Artificial Silk Industry

In reply to a question by Mr. Kelly (House of Commons, December 24), Miss Bondfield stated that the estimated number of insured persons, aged 16 to 64, classified as belonging to the silk and artificial silk industries in Great Britain at July, 1929, was 73,480. The number of such persons recorded as unemployed at November 25 was 8,730. Separate statistics for the artificial silk industry were not available.

### Rayon Production in 1929

BRITISH RAYON PRODUCTION in 1929 is estimated to exceed the 1928 total by three and a quarter million pounds. Production in the first eleven months was 52.9 million pounds, against 50.5 millions in the corresponding period of 1928. During 1928 the production exceeded consumption, but by May, 1929, this was checked, and the output is now apparently being absorbed.

### A Bookman's Column

LONGMANS GREEN AND CO. have recently published two additions to their series of "Text Books of Physical Chemistry." The first is entitled *Photo-Processes in Gaseous and Liquid Systems*, by Drs. R. O. Griffith and A. McKeown (pp. 691, 25s.) The subject is dealt with under the following headings:—Quantum Theory; Excitation Potentials and Absorption Spectra; Molecular Spectra; Fluorescence; Chemiluminescence; Photochemical Reactions; Einstein's Law; the Hydrochloric Acid and Carbon Monoxide-Chlorine Reactions; Photosensitisation; Photochemical Catalysis; with an appendix on the Chemical Effects of X-Rays,  $\alpha$ -Particles and Electrons.

The effect of intensive drying on the behaviour of various substances has been studied for many years by Professor H. B. Baker, and latterly by Professor A. Smits and others. In the second of the publications by Longmans Green referred to above, the subject is dealt with by Dr. J. W. Smith under the title *The Effects of Moisture on Chemical and Physical Changes* (pp. 235, 15s.) A surprisingly large amount of work has been done in this field, the reactions discussed including those between gases, between solids and gases, between solids, and in non-aqueous solvents. As Professor Donnan says in the preface, "it is clear from recently published papers that the last word in connection with this group of phenomena has by no means been said." It is obvious that the facts which have been accumulated have bearing on all aspects of chemistry both pure and applied, and workers in both groups will find in Dr. Smith's monograph much information which should lead, when generally known, to further important investigations.

A group of German books on oils, fats and related matters are just to hand. The firm of S. Hirzel, of Leipzig, is publishing a second, revised edition of Ubbelohde's *Handbuch der Technologie der Ole und Fette*, edited by Dr. H. Heller. This work is planned on very comprehensive lines, in four volumes, of which there have appeared to date Volume 1 (pp. 791, bound R.M. 75, unbound R.M. 68), dealing with "Oils, Fats and Waxes: General"; and Volume 3, Part 2 (pp. 752, same price), dealing with "The Soaps." In many respects, this new edition is practically a new work.

Two volumes have appeared in the series of monographs on the chemistry of the fats, published by the Wissenschaftliche Verlagsgesellschaft m.b.H. of Stuttgart. The first, by Dr. Heinrich Fincke, is entitled *Die Kakaobutter und Ihre Verälschungen* (pp. 238, R.M. 20). This book was produced as the result of the offer of a prize by the Union of German Chocolate Manufacturers, and deals with the examination of the physical and chemical characteristics of the fats derived from cocoa beans and contained in cocoa products, as well as the detection of adulterants in these fats. There is also a section on the standardisation of methods of investigation of edible fats. A further volume in the same series is *Die Ole und Fette in der Textilindustrie*, by Professor Herbig (second edition, pp. 451, R.M. 32). The scope of this book may be inferred from the chapter headings: Fats, Oils and Waxes; Methods of Investigation of Fats and Oils; Textile Soaps and Washing Materials; Analysis and Examination of Textile Soaps; Textile Oils; Analysis and Examination of Turkey Red Oils and the Newer Textile Oils.

Mr. K. M. Nadkarni has written, and A. K. Nadkarni and Co. (of Kasagarod) have published, *The Indian Materia Medica* (pp. 1142, plus indexes). This volume contains an enormous amount of information about Indian drugs, vegetable, animal and mineral. Each is discussed with regard to its origin, constituents, action, and uses.

### New Alkali Inspector

THE post of alkali inspector for the vacant District VII has now been filled by the appointment of Mr. C. Bride, M.A., B.Sc., A.I.C. Mr. Bride's London address is not yet settled, but his present address is 14, Dacre Gardens, Consett. He has been in the employment of the Consett Iron and Steel Co.

## From Week to Week

THE LAUTARO NITRATE Co. announces that its address is now Cory Buildings, 117, Fenchurch Street, London, E.C.3.

THE BOARD OF TRADE have appointed Mr. James Henderson to be a member of the Area Gas Supply Committee in the place of the late Dr. M. Mannaberg.

THE AMSTERDAM SUPERPHOSPHATE Co. announces that on completion of its new sulphuric acid plant it will cease importing acid from Germany and Belgium.

DR. MÜLLER, a German chemist, and Dr. Rauch, owner of a chemical factory near Geneva, have been arrested in Bâle in connection with illicit traffic in drugs.

THE TECHNICAL ADVERTISING SERVICE announce that their address is now as follows:—Aldwych House, Aldwych, W.C.2 (telephone, Holborn 2968—2 lines).

DEPOSITS OF TITANIUM MINERALS of considerable extent have been discovered on the Japanese island of Nagasaki. Hitherto Japan has had to import all her requirements of titanium compounds.

UNIVERSITY NEWS: London.—The degree of Doctor of Science has been conferred on Mr. J. Bardhan (Imperial College), Mr. K. Krishnamurti (University College), and Mr. F. G. Mann (Battersea Polytechnic).

METHANOL SYNTHESIS is reported to be making great strides in France. The Mines de Bethune, which for two years have been producing 3,000 litres per day, are about to double their output, and are putting up a plant which will shortly triple it. Their production of formaldehyde is 120 tons a month, and of ether 1,000 litres a day.

A CATCH OF WHALES producing 90,500 barrels of oil, valued at over £377,000, is reported for the first seven weeks of the 1929 Antarctic season, ended December 8, by Anglo-Norwegian Holdings, Ltd., the largest British unit in the whaling industry, for the companies it controls. During the same period last year 61,500 barrels of oil were produced.

THE GERMAN BITUMEN-KONVENTION has been joined by the Deutsche Gasolin A.-G. (subsidiary to the I.G.), the Mineralöl-und Asphaltwerke A.-G., the Mineralölwerk Lichtenberg G.m.b.H. and the Mineralöl-und Asphaltwerke Schmitz Kommanditgesellschaft. Production is to be rationed. A price convention of German cold asphalt manufacturers has also been formed, having its headquarters at Frankfurt-am-Main.

A DRAFT ORDER for the welfare of workers in factories and workshops where Portland cement or similar cement is made has been issued by the Home Secretary. The order provides for the provision of watertight thigh-boots, goggles, waterproof coats and overalls and head coverings for workers requiring them; accommodation for discarded clothing; rest facilities for women who work standing; a suitable mess-room for workers; and washing facilities. Objections to the order, which has been prepared after discussion with the National Joint Industrial Council for the industry, must be made soon.

THE STICKSTOFFGESELLSCHAFT WALDENBURG, the first undertaking in Lower Silesia, Germany, for the production of nitrogen compounds from coke oven gas, is commencing operations at the beginning of 1930. The method of ammonia synthesis will be that developed by the Nitrogen Engineering Corporation. The coke oven gas will be cracked according to the method of the French Kuhlmann concern, and the plant will produce its own sulphuric acid. The plant for the treatment of air and for gas mixing will be supplied by Messer and Co., of Frankfurt-on-Main. The daily production will be 70,000 kg. of pure ammonia, equivalent to an annual production of 15,000 tons of pure nitrogen.

THE OWNERSHIP OF PRIVATE WAGONS on the railways is being considered by a special sub-committee of the F.B.I. Transport Committee. The question, which has been so much before the country recently, as to the advantages and disadvantages of the present system of wagons being largely in private ownership, is of considerable importance, not only to the trader who owns rail wagons himself but also to other firms who do not own their railway wagons and to the railway companies themselves. The matter is one of considerable complexity involving wide issues, but the sub-committee is carefully investigating the whole position, and it is hoped that a report will be made to the Grand Council very shortly.

RUSTON AND HORNSEY, LTD., the Lincoln oil engine manufacturers, have just received instructions to put in hand nine Ruston marine auxiliary oil engine generating sets, each of 300 KW. According to information available these generating sets will be installed (three sets per vessel) on board three motor cargo liners to be built for the New Zealand Shipping Co., Ltd. Two of the vessels will be built by Alexander Stephen and Sons, Ltd., in their shipyard at Govan, Glasgow, and the other by Vickers-Armstrongs Ltd., at Barrow-in-Furness. Each auxiliary engine will be a 5-cylinder unit working on the Ruston principle of airless injection, capable of developing 450 b.h.p. at 270 r.p.m. or 500 b.h.p. at 300 r.p.m., and will drive a d.c. dynamo supplied by the General Electric Co.

THE AMERICAN CHEMICAL SOCIETY's annual election has resulted as follows:—President, William McPherson; President-elect, Moses Gomberg.

MR. C. M. HILL has been appointed a director of British Drug Houses, Ltd., and Mr. Ralph K. Harvey and Mr. Roger M. Harvey have retired from the Board.

TWENTY-SIX BELGIAN manufacturers of glassware are on the point of forming a cartel, with a view to regulating prices and protecting the interests of the industry.

MR. T. SYDNEY PARRY, chairman of Owen Parry, Ltd., and a director of the British Oil and Cake Mills, Ltd., has retired from both companies as from December 31, 1929.

THE CARBO UNION, the Verein für Chemische Industrie, and the Norit Maatschappij have, according to *Die Metallbörse*, arrived at an agreement regarding technical collaboration.

"NEOFIL" is the term adopted by the Italian producers of artificial silk as the official Italian designation of the product. The term was obtained as the result of the offer of a prize.

LORD MELCHETT and a number of his colleagues are leaving shortly for South Africa, where I.C.I. has large explosives works, in order to consider developments required by the needs of the mining industry.

RECENT WILLS INCLUDE:—Mr. William Bannister, Croydon, chairman of the Chloride Electrical Storage Co., Ltd., Manchester, formerly managing partner in the firm of W. and H. M. Goulding, chemical manufacturers, of Cork (net personalty £119,146), £128,418.

THE STATUTORY MEETING of the creditors of Danish Soap Industry, Ltd., of London, in voluntary liquidation, was held on December 23 at the office of Thorne, Lancaster and Co., C.A., 46, Basinghall Street, London, when it was stated that all the London creditors would be paid in full.

JAMES PASCALL, LTD. (Blackfriars Road, London, S.E.1) announce that their offices are now at Mitcham, Surrey. It is therefore requested that all invoices, statements, and correspondence relating to accounts be sent to the Mitcham address. Any letters relating to buying or deliveries of materials ordered by A Dept., Blackfriars, should be sent to 100, Blackfriars Road, as hitherto.

THE NEXT MEETING of members of the Institute of Fuel will be held in the rooms of the Chemical Society, Burlington House, London, on Wednesday, January 8, when a paper will be presented on "Fuel Economisers with Special Reference to their Construction, Materials and Recent Developments," by Mr. O. Kubalek, M.Sc. (member). The chair will be taken at 6 p.m. by Mr. R. A. Chattock, Past President of the Institution of Electrical Engineers.

IMPERIAL CHEMICAL INDUSTRIES have made a grant of £50,000 for "hard cases" among their employees. This money is to be handed to the different works' councils to be distributed as the cases arise. In making the grant the directors are following the practice which was in operation at the Winnington works of Brunner, Mond and Co. for many years. The Winnington scheme was instituted by the late Dr. Mond, and his son, Lord Melchett, desires that the same elasticity and latitude should be preserved.

IN CONNECTION with the recent articles which have appeared in *THE CHEMICAL AGE* on science and legislation, it is understood that a League of Science has been formed to further the developments outlined; and that Mr. W. P. Dreaper is the first hon. secretary. The league will in no way compete with any existing organisations, but will supplement their activities, particularly in the Dominions, and also in the United States and elsewhere. The temporary address is 27, Willow Road, Hampstead Heath, London.

THE LUFTSCHIFFBAUGESELLSCHAFT ZEPPELIN (the Zeppelin construction company) is negotiating with the United States Government with regard to a supply of helium for the new Zeppelin airship. It is argued that as the ship is to be used for communication between Germany and the United States, the helium supplied would not really be exported. The recent development of helium production at Amarillo, Texas (which has been described at length in *THE CHEMICAL AGE*), will permit the United States Government to release some for export without any risk of endangering the needs of its own airships.

### Obituary

MR. ARTHUR WILLIAM WARDROP, aged 58, of A. W. Wardrop and Co., chemical brokers, of Bath Street, Glasgow.

MR. ALFRED T. JENKINS, J.P., chairman of Robert Jenkins and Co. Ltd., engineers, Rotherham, who had been connected with the firm for very many years, on Sunday, December 29, 1929, in his 78th year.

MR. H. C. AUSTIN, proprietor of the Allscott Fertiliser Factory, recently, at Allscott Manor, near Wellington, aged 83. He was for many years chairman of the Wellington Market Co., and a member of the Wellington Board of Guardians.

MR. ERNEST A. PINCHIN, B.Sc., F.I.C., recently, of pneumonia, at his home in Streatham. Born in 1874, Mr. Pinchin was educated at the Royal College of Science and the Birkbeck Institution. He was for many years public analyst to the Corporation of the City of London and to the metropolitan boroughs of Camberwell and Islington, and a gas examiner to the London County Council. He received the medal of the Royal Photographic Society in 1915.



# References to Current Literature

## British

ANALYSIS.—Investigations into the analytical chemistry of tantalum, niobium and their mineral associates. XVI.—Observations on tartaric hydrolysis. XVII.—The quantitative precipitation of the earth acids and certain other oxides from tartrate solution. W. R. Schoeller and H. W. Webb. *Analyst*, December, pp. 704-715.

The determination of small quantities of lead, with special reference to urine and biological materials. A. G. Francis, C. O. Harvey and J. L. Buchan. *Analyst*, December, pp. 725-735.

ANALYSIS, FOOD.—A study of the methods of determining boron compounds in foods and drugs. II.—Experimental: Effect of fats and other organic substances in the determination. A. S. Dodd. *Analyst*, December, pp. 715-725.

APPARATUS.—Automatic pipette. A. Henderson and J. Roberts. *Analyst*, December, pp. 737-739.

BUILDING.—Chemistry in the building industry. G. J. Twine. *Chem. Engineering and Mining Review* (Australia), November 5, pp. 61-66.

ELECTROCHEMISTRY.—The determination of transference numbers in aqueous solutions. A. H. Richards. *Chem. Engineering and Mining Review* (Australia), November 5, pp. 69-70.

FUR.—The chemical examination of furs in relation to dermatitis. H. E. Cox. *Analyst*, December, pp. 694-703.

GENERAL.—The solvent action of ferrous sulphate solution on oxidised copper ore. W. G. Murray. *Chem. Engineering and Mining Review* (Australia), November 5, pp. 52-54.

INSULIN.—Factors in the liberation of insulin and the interference effects of certain chemical substances. C. H. Best. *Canadian Chem. and Met.*, December, pp. 322-323, 325.

PAINT.—Serviceability testing of paint and varnish products. W. T. Pearce. *Canadian Chem. and Met.*, December, pp. 320-321.

PLANT.—The Australian retort for oil-shale distillation. *Chem. Engineering and Mining Review* (Australia), November 5, pp. 55-56.

VULCANISATION.—Vulcanisation experiments with aniline sulphate. A. Zeitlin and L. H. Williams. *Transactions Institute Rubber Industry*, October, pp. 173-178.

The accelerating influence of a basic azo-dye in vulcanisation. T. J. Drakeley and A. G. Coulson. *Transactions Institute Rubber Industry*, October, pp. 179-183.

## United States

APPARATUS.—Apparatus for the determination of moisture content of solids and the sorption of gases and vapours by solids at elevated temperatures. W. E. Kuentzel. *Journ. Amer. Chem. Soc.*, December, pp. 3560-3561.

CHEMICAL ENGINEERING.—Evaporation in chemical manufacture. L. C. Cooley. *Chem. Markets*, December, pp. 619-623.

Chemical engineering in modern stearic acid plant. T. R. Olive. *Chem. and Met. Eng.*, December, pp. 720-723.

Calculating tanks for high temperature and pressure. J. K. Wood. *Chem. and Met. Eng.*, December, pp. 737-740. Gives a line chart for easy calculations.

COLORIMETRY.—Solutions for colorimetric standards. II.—The relation of colour to concentration for aqueous solutions of certain inorganic salts. M. G. Mellon. *Journ. Physical Chem.*, December, pp. 1931-1940.

CONSTRUCTION MATERIALS.—Construction materials for handling corrosive agents. A. H. Cooper. *Chem. and Met. Eng.*, December, pp. 747-750. Deals with modern practice with regard to nitric, hydrochloric and acetic acids; alkalis; ammonia; and hydrogen sulphide.

GENERAL.—Anhydrous aluminium chloride. K. H. Klipstein. *Chem. Markets*, December, pp. 593-595.

Industrial uses of shellac. W. H. Zinsser. *Chem. Markets*, December, pp. 596-598.

The nature and source of plant nitrogen. S. L. Jodidi. *Journ. Franklin Inst.*, December, pp. 767-771.

Producing alumina by acid and electro-thermal processes. J. D. Edwards and R. B. Mason. *Chem. and Met. Eng.*, December, pp. 730-733. Dry processes intended chiefly for producing alumina from materials other than bauxite are discussed, as well as the electrothermal pro-

cesses, including the "Dry Process," developed by the Alumnium Co. of America.

Fundamental principles in air conditioning. C. A. Bulkeley. *Chem. and Met. Eng.*, December, pp. 734-736.

PECTIN.—The formation of pectin jellies by sugar. G. Spencer. *Journ. Physical Chem.*, December, pp. 1987-2011.

The effect of salts on sugar-pectin jelly formation. G. Spencer. *Journ. Physical Chem.*, December, pp. 2012-2019.

PETROLEUM.—The Edeleanu process creates a new use for liquid sulphur dioxide in the refining of petroleum distillates. R. L. Brandt. *Chem. Markets*, December, pp. 603-606.

REFRIGERATION.—Contributions of chemicals to the refrigeration industry. J. B. Churchill. *Chem. Markets*, December, pp. 587-592.

SAFETY.—Plant safety organisation. G. H. Miller. *Chem. Markets*, December, pp. 611-617.

## German

ANALYSIS.—The technique of fluorescence-analysis. M. Haitinger and V. Reich. *Chemische Fabrik*, December 18, p. 529. Ultra-violet light from a mercury vapour lamp can be so concentrated by means of a simple water lens, that with an ordinary microscope bright and contrasting fluorescence images are obtained.

APPARATUS.—Apparatus for the measurement of the permeability to liquids and gases of skin, leather, wood and other sheet structures. M. Bergmann. *Chemische Fabrik*, December 18, pp. 527-528.

A new dosage weighing machine. E. Franke. *Chemische Fabrik*, December 18, pp. 528-529.

Self-acting weighing apparatus. K. Diehl. *Chemische Fabrik*, December 25, pp. 535-537.

The apparatus for determining the adhesive power of starch, according to Saare. W. Ekhard. *Chemiker-Zeitung*, December 18, pp. 975-976.

A new electric stirrer for difficultly miscible liquids. *Chemiker-Zeitung*, December 25, p. 996.

A new apparatus for the determination of corrected melting points. C. Junge. *Chemiker-Zeitung*, December 25, p. 996.

CEMENT, CONCRETE, ETC.—The action of silicofluorides on cement and concrete. E. Gruner and U. Werther. *Zeitschrift angewandte Chem.*, December 14, pp. 1133-1137.

COCOA BUTTER.—Contributions to the knowledge of cocoa butter. II.—The partial iodine value of fats, especially of cocoa butter. H. P. Kaufmann. *Zeitschrift angewandte Chem.*, December 21, pp. 1154-1157.

DYES, ETC.—New dyestuffs, pattern cards and textile accessory materials. P. Kraus. *Zeitschrift angewandte Chem.*, December 14, pp. 1137-1140.

GENERAL.—Metallised combustible substances. M. U. Schoop. *Chemische Fabrik*, December 25, p. 537. The metal spraying process may be used for coating even inflammable substances—e.g., wood, textile fabrics, celluloid or paper.

Investigations on writing and envelopes. O. Mezger. *Chemiker-Zeitung*, December 14, pp. 965-968; December 21, pp. 985-987; December 28, pp. 1006-1009.

The suitability of pure aluminium vessels for cooking purposes. A. Thieme. *Chemiker-Zeitung*, December 18, pp. 973-974.

The manufacture of zinc chloride and zinc sulphate. F. Chemnitius. *Chemiker-Zeitung*, December 25, pp. 994-995.

ULTRAMARINE.—The ultramarine problem in the light of recent research. J. Hoffmann. *Chemiker-Zeitung*, December 11, pp. 953-954; December 18, pp. 974-975.

## Miscellaneous

ANALYSIS.—A new reagent and method for the determination of cadmium. Evrard. *Annales Chimie Analytique*, November 15, pp. 322-326 (in French). The reagent used is the equimolar compound of hexamethylenetetramine and allyl iodide.

The micro-determination of sugar and its application to the study of blood sugar. E. J. Bigwood. *Bulletin Société Chimique Belgique*, October, pp. 317-321 (in French).

## Patent Literature

*The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.*

### Abstracts of Accepted Specifications

- 321,155. DYES. O. Y. Imray, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, June 27, 1928.

The starting materials for these dyes are condensation products obtained by the action of formaldehyde on a methylene base of a cyclammonium salt having a reactive methyl group in the  $\alpha$ -position, or by removal of acid from the product produced from formaldehyde and a cyclammonium salt having a reactive methyl group in the  $\alpha$ -position. To obtain the dyestuffs, these substances are oxidised in a medium which is non-alkaline. In an example, formaldehyde is condensed with 1:3:3-trimethyl-2-methyleneindolin in alcoholic solution, the product is dissolved in benzene, and is oxidised by benzoquinone or lead peroxide in the presence of acetic acid. The resulting addition product of 1:3:3:1<sup>1</sup>:3<sup>1</sup>:3<sup>1</sup>:hexamethyl-streptomono-vinylene 2:2<sup>1</sup>-indo-cyanine acetate with hydroquinone may be treated with alkali to obtain the free base, which is soluble in dilute hydrochloric acid. Another example is given of the dyestuff obtained by oxidising methylene-di-quinaldine-iodomethylate.

- 321,161. DYES AND INTERMEDIATES. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, July 30, 1928.

Pyranthrone or its derivatives is halogenated in sulphuric acid or a derivative by means of so much halogen or halogenating agent as to produce pyranthrone containing more than four halogen atoms, in the presence of a halogen transfer agent such as iodine, sulphur, selenium, iron, manganese, antimony, or mercury. Halogenated pyranthrone containing one to four halogen atoms may be further halogenated with a different halogen, or pyranthrone may be brominated in the presence of chlor-sulphonic acid to obtain mixed halogen derivatives. Examples are given of the production of pentabrom-pyranthrone, pentabrom-monochlor-pyranthrone, and hexabrom-dichlor-pyranthrone.

- 321,177. PYRIDINE BASES. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, July 27, 1928.

A mixture of acetylene and ammonia is passed at a temperature below 350° C. over catalysts containing highly dispersed metallic lead, cadmium, bismuth, or gold, on a highly porous carrier such as aluminium, zinc, or silicon oxide. To obtain the catalyst, the porous carrier may be mixed with a salt of one of the metals and heated in a reducing atmosphere, or the metal oxide may be mixed with alumina, or the mixed oxides may be precipitated from lead and zinc nitrates and then reduced in hydrogen. Thus, the catalyst may be obtained by impregnating active silica with cadmium and aluminium nitrates, drying, and reducing in hydrogen at 400° C. The products are pyridine bases such as picoline, lutidine, and collidine. In one example, gases containing hydrogen, methane, and acetylene, produced by electrothermic decomposition or natural gas and hydrogen are mixed with ammonia and passed over a catalyst obtained from cadmium and lead nitrates. The condensate consists mainly of pyridines, and the remaining gas is mixed with ammonia and treated again. The products, or a fraction boiling between 100° and 150° C. may be used for denaturing alcohol.

- 321,190. DYEING AND TANNING AGENTS. A. Carpmal, London. From I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, June 28, 1928.

A mixture of an aromatic hydrocarbon or a hydroxy derivative, and a natural resin is sulphonated and then condensed with an alkyl halide to obtain a water-soluble condensation product for use in tanning, dyeing, and printing. Thus, a solution of colophony and naphthalene or crude cresol may be sulphonated and the product treated with benzyl chloride. An example of the dyeing of a mixture of wool, cotton, and artificial silk is given. The

material is dyed with Orange II and then with Brilliant Benzo Blue 6B with the addition of one of the above products; the wool remains unchanged.

- 321,192. DYES. R. J. Loveluck, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Scotland. Application date, April 30, 1928.

Arylido-indantrones and their derivatives, particularly 4:4'-diaryldoindantrones are treated with halogenating agents to obtain vat dyes. The above indantrones may be obtained by condensing 1-amino-2:4-dihalo-anthraquinones with aniline or toluidine in the presence of a copper salt and an acid absorber, and converting the 1-amino-2-halo-4-arylido-anthraquinone into the indanthrone by heating with a copper salt and an acid absorber in a solvent such as naphthalene. Examples are given of the production of dichlor-4:4'-dianilido-indanthrone, tetrachlor-4:4'-dianilido-indanthrone, and a dibrom derivative, which dye in fast yellowish-green to green shades.

- 321,200. TREATING LIQUIDS WITH LIQUIDS. Anglo-Persian Oil Co., Ltd., Britannic House, Finsbury Circus, London, A. E. Holley, Orilbar, Dominion Road, Worthing, and O. E. Mott, Repton, Chertsey Road, Feltham, Middlesex. Application date, July 3, 1928.

Oils are treated with acids and alkalies in a series of pairs of mixing and separating vessels through which the liquids flow in counter current. Each mixing vessel is connected to a corresponding separating vessel, and an additional connecting pipe is provided at the bottom by which a part of the heavier liquid is returned to the mixing vessel, while the remainder of the heavier liquid and the lighter liquid pass to the preceding and succeeding mixing vessels respectively.

- 321,241. ACETALDEHYDE AND ACETIC ACID. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, August 9, 1928.

Acetylene and water vapour, with or without oxygen, are passed over a catalyst consisting of non-volatile mercury compounds with or without heavy metal compounds or carriers, e.g., mercury phosphate, vanadate, or sulphate, with silver or tin vanadate, or the vanadates or oxides of zinc, iron, manganese, and cerium, or the oxides of tungsten or vanadium. The products are acetaldehyde and acetic acid. In an example, gas containing 7 per cent. of acetylene is passed through water at 50° C. and then at 110° C. over active charcoal or fireclay impregnated with mercuric phosphate to obtain acetaldehyde. In another example, a gas containing 7 per cent. of acetylene, 10 per cent. of oxygen and a little hydrogen, is saturated with water vapour at ordinary temperature and passed at 200° C. over mercury vanadate to obtain acetic acid. Examples are also given of the use of other catalysts.

- 321,250. CALCIUM HYPOCHLORITE. L. Mellersh-Jackson, London. From Mathieson Alkali Works, 250, Park Avenue, New York. Application date, August 18, 1928.

Caustic soda solution containing a suspension of lime in excess of that chemically equivalent to that of the soda is chlorinated to obtain calcium hypochlorite. Contamination with calcium chloride is prevented by filtering and pressing, or by treating the precipitate with sodium hypochlorite, or by treating the chlorinated mixture with sodium hypochlorite before separation of the calcium hypochlorite.

- 321,260. DISPERSIONS CONTAINING COPPER. Dr. A. Wacker Ges. für Elektrochemische Industrie Ges., 20, Prinzregentenstrasse, Munich, F. Kaufler, 20, Tengstrasse, Munich, Germany, and F. X. Schwaebel, 16, Leopoldstrasse, Munich, Germany. Application date, August 28, 1928.

Cupric chloride and copper are treated with air to obtain copper oxychloride. This is dispersed in water, with or without a protective colloid, as a spraying agent for plants.

321,190. ABSORPTION OF SULPHUROUS GASES. National Processes, Ltd., 27, Old Broad Street, London, and T. B. Giles, 8, Kennington Avenue, Bishopston, Bristol. Application date, July 27, 1928.

Gases which are too poor in sulphur for the manufacture of sulphuric acid are treated for the removal of sulphur compounds by passing them through or over moistened sintered or porous granular or agglomerated material obtained by blast-roasting zinc sulphide ores. The gas may be passed into the centre of the moist sintered ore, or upwards through a tower containing the ore, to which water is supplied to leach out the sulphates and sulphites. The ore after use may be mixed with fresh batches of ore and roasted again.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 294,661 (I.G. Farbenindustrie Akt.-Ges.), relating to synthetic rubber, see Vol. XIX, p. 323; 295,944 and 296,310 (Soc. of Chemical Industry in Basle), relating to manufacture of dyestuffs, see Vol. XIX, pp. 399 and 441; 296,730 (I.G. Farbenindustrie Akt.-Ges.), relating to white titan acid, see Vol. XIX, p. 466; 297,114 (Kali-Industrie Akt.-Ges., C. T. Thorssell and A. Kristensson), relating to removal of sulphuretted hydrogen from gases, see Vol. XIX, p. 497; 298,100 (Kali-Industrie Akt.-Ges., and C. T. Thorssell), relating to production of nitrogen and hydrogen, see Vol. XIX, p. 543; 302,143 (Goodyear Tire and Rubber Co.), relating to a vulcanisation accelerator, see Vol. XX, p. 159; 308,210 (Consortium für Elektrochemische Industrie Ges.), relating to manufacture of concentrated acetic acid, see Vol. XX, p. 507.

#### Specifications Accepted with Date of Application

- 295,593. 4-methyl-6-halogen-hydroxythionaphthenes, Manufacture of. I.G. Farbenindustrie Akt.-Ges. August 11, 1927.  
 296,988. Electrolytic deposits of chromium which adhere and penetrate into recesses, Process for producing. W. G. Poetzsch. September 10, 1927.  
 297,116. Colloidal white lead, Process for producing. T. Goldschmidt. Akt.-Ges. September 15, 1927.  
 297,123. Sulphur dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. September 15, 1927. Addition to 286,005 and 285,382.  
 297,687. Dyestuffs, containing metal, Manufacture of. Soc. of Chemical Industry in Basle. September 24, 1927.  
 301,395. Cracking or destructive hydrogenation of oils. F. Hofmann and C. Wulff. November 27, 1927.  
 302,306. Nitrogen, hydrogen, or mixtures thereof, Purification of. Soc. d'Etudes Minières et Industrielles. December 14, 1927.  
 305,102. Electromagnetic separation of complex ores. British Thomson-Houston Co., Ltd. January 30, 1928.  
 322,734. Valuable gases, Process of obtaining. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) September 3, 1928.  
 322,737. Sulphonated organic condensation products, Manufacture of. British Celanese, Ltd., G. H. Ellis, H. C. Olpin, and E. W. Kirk. September 8, 1928.  
 322,745. 2-methylbenzanthrones, Manufacture of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) September 7, 1928.  
 322,909. Calcium formate, Production of. Lady O. M. Manning. (Lanza Elektrizitätswerke und Chemische Fabriken Akt.-Ges.) December 22, 1928.  
 322,917. Carbonaceous materials prior to destructive hydrogenation, Treatment of. W. R. Tate, H. P. Stephenson, and Imperial Chemical Industries, Ltd. December 31, 1928.  
 322,977. Concentration of sulphuric acid. W. Busching. March 22, 1929.  
 322,750. Condensation products of the anthraquinone series, Production of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) September 6, 1928.

#### Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

- Anglo Pencil Co., Ltd., Pollopos, Ltd., and Smith, M. Urea formaldehyde, phenol-formaldehyde, thiourea, etc., condensation products. 38,775. December 18.  
 Arnold, C., and Dow Chemical Co. Preparation of magnesium and magnesium chloride by electrolysis. 38,552. December 16.  
 Barrett Co. Distillation of tar. 38,784, 38,796, 38,812. December 18. (United States, December 18, 1928.)  
 — Distillation of hydrocarbons. 38,852. December 18. (United States, December 18, 1928.)  
 Bensa, F. Manufacture of vat dyestuffs. 38,459. December 16. (Austria, January 9.)

- Bloxam, A. G., and Kuhn, R. Catalytically oxidising hydrogen sulphide. 39,170. December 21.  
 Boehringer and Soehne Ges., C. F., and Ellis, G. B. Catalytic production of acetaldehyde. 38,555. December 16.  
 Carpmal, A., and I.G. Farbenindustrie Akt.-Ges. Decreasing inflammability of organic materials. 38,709. December 17.  
 — Manufacture of polymerisation products of diolefines. 39,078. December 20. (January 29.)  
 Du Pont de Nemours and Co., E. I., and Imperial Chemical Industries, Ltd. Emulsions. 38,983. December 19.  
 I.G. Farbenindustrie Akt.-Ges. Colouring rubber. 38,506. December 16.  
 — Manufacture of resinous materials. 38,507. December 16.  
 — Manufacture of vat dyestuffs. 38,508. December 16.  
 — Manufacture of 2. acylbenzanthrones. 38,509. December 16.  
 — Manufacture of condensation products. 38,510. December 16.  
 — Cold asphalt. 38,535. December 16. (Germany, December 15, 1928.)  
 — Manufacture of azo dyestuffs. 38,669. December 17. (Germany, December 17, 1928.)  
 — Manufacture of vat dyestuffs. 38,688. December 17. (Germany, December 17, 1928.)  
 — Manufacture of butadiene, etc. 38,818. December 18. (Germany, December 18, 1928.)  
 — Manufacture of aromatic acylamino-compounds. 38,820. December 18. (Germany, December 19, 1928.)  
 — Manufacture of cellulose esters. 39,091. December 20. (Germany, December 20, 1928.)  
 — Manufacture of cellulose ester silk. 39,092. December 20. (Germany, December 20, 1928.)  
 — Manufacture of stable solutions of hormones. 39,104. December 20. (Germany, December 20, 1928.)  
 I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of viscous products of high boiling point. 38,845. December 18.  
 — Dyeing mixed fabrics. 38,846. December 18.  
 — Manufacture of vat dyestuffs. 38,847, 38,848. December 18.  
 Imperial Chemical Industries, Ltd. Recovery of gases from solutions. 38,641. December 17.  
 — Destructive hydrogenation of coal, oils, etc. 38,642. December 17.  
 — Extraction of oils from solid residues from hydrogenation of coal, etc. 38,749. December 18.  
 — Production of granular materials. 38,889. December 19.  
 — Method of granulating. 38,890. December 19.  
 — Electrolytic reduction of organic compounds. 38,937. December 19.  
 — Treatment of hydrocarbon gases. 38,938. December 19.  
 — Recovering carbon disulphide. 38,939. December 19.  
 — Destructive hydrogenation. 39,080. December 20.  
 — Producing acetone. 39,114. December 21.  
 Newport Co. Preparing 1-amino-4-halogen-9-anthrene and substitution products and derivatives thereof. 38,546. December 16. (United States, January 2.)  
 Seddon Co. Contact sulphuric acid process. 38,495. December 16. (United States, January 22.)

#### Nitrate Fusion

A CIRCULAR to shareholders of the Lagunas Nitrate Co. states that as the company's oficina has been operating more or less continuously for over thirty years, the reserves of raw material are naturally diminishing, but there is no reason to suppose that with adequate supplies of raw material, production cannot be continued at an economical cost for a number of years. The Lagunas Syndicate, whose properties adjoin those of the company, possesses two plants which are no longer economical producers, but it also possesses grounds containing workable raw material which could be economically treated in the company's oficina. A scheme has been prepared, therefore, for the amalgamation of the two companies, under which the syndicate is to be placed in liquidation and the whole of its property and assets transferred to the Lagunas Nitrate Co. The capital of the latter will be reduced to £180,000 by writing £4 off each £5 share, and will then be increased by the creation of 27,500 shares of £1, which will form the purchase consideration payable for the assets of the syndicate, shareholders of which will receive one new share for each twenty shares held. Holders of the syndicate's 6 per cent. debentures are to receive payment of interest up to December 31, 1929, and are to receive in exchange for their holdings 6 per cent. debentures in the company. It is estimated that the gross trading profits of the combined concerns should be £30,000 per annum, which would enable all liabilities other than debentures to be paid off within two years and the necessary working capital to be provided.



## Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

### General Heavy Chemicals

**ACID ACETIC, 40% TECH.**—£19 per ton.  
**ACID, CHROMIC.**—1s. 1½d. per lb.  
**ACID HYDROCHLORIC.**—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.  
**ACID NITRIC, 80° Tw.**—£21 10s. to £27 per ton, makers' works according to district and quality.  
**ACID SULPHURIC.**—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.  
**AMMONIA ALKALI.**—£6 15s. per ton f.o.r. Special terms for contracts.  
**AMMONIUM BICHROMATE.**—8½d. per lb.  
**BISULPHITE OF LIME.**—£7 10s. per ton, f.o.r. London, packages free.  
**BLEACHING POWDER.**—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.  
**BORAX, COMMERCIAL.**—Crystals, £19 10s. to £20 per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain.)  
**CALCIUM CHLORIDE (SOLID).**—£5 to £5 5s. per ton d/d carr. paid.  
**CHROMIUM OXIDE.**—10d. and 10½d. per lb. according to quantity.  
**COPPER SULPHATE.**—£25 to £25 10s. per ton.  
**METHYLATED SPIRIT 61 O.P.**—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., rd. extra in all cases.  
**NICKEL SULPHATE.**—£38 per ton d/d.  
**NICKEL AMMONIA SULPHATE.**—£38 per ton d/d.  
**POTASH CAUSTIC.**—£30 to £33 per ton.  
**POTASSIUM BICHROMATE CRYSTALS.**—4½d. per lb. nett d/d U.K. spot; ground ½d. per lb. extra.  
**POTASSIUM CHLORATE.**—3½d. per lb., ex-wharf, London, in cwt. kegs.  
**POTASSIUM CHROMATE.**—8½d. per lb.  
**SALAMMONIAC.**—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.  
**SALT CAKE.**—£3 15s. to £4 per ton d/d. In bulk.  
**SODA CAUSTIC, SOLID.**—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.  
**SODA CRYSTALS.**—£5 to £5 5s. per ton, ex railway depots or ports.  
**SODIUM ACETATE 97/98%.**—£21 per ton.  
**SODIUM BICARBONATE.**—£10 10s. per ton, carr. paid.  
**SODIUM BICHROMATE CRYSTALS, CAKE AND POWDER.**—3½d. per lb. nett d/d U.K. spot. Anhydrous ½d. per lb. extra.  
**SODIUM BISULPHITE POWDER, 60/62%.**—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.  
**SODIUM CHLORATE.**—2½d. per lb.  
**SODIUM CHROMATE.**—3½d. per lb.  
**SODIUM NITRITE, 100% BASIS.**—£27 per ton d/d.  
**SODIUM PHOSPHATE.**—£14 per ton, f.o.b. London, casks free.  
**SODIUM SULPHATE (GLAUBER SALTS).**—£3 12s. 6d. per ton.  
**SODIUM SULPHIDE CONC. SOLID, 60/65.**—£13 5s. per ton d/d. Contract, £13. Carr. paid.  
**SODIUM SULPHIDE CRYSTALS.**—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.  
**SODIUM SULPHITE, PEA CRYSTALS.**—£14 per ton f.o.b. London, 1-cwt. kegs included.

### Coal Tar Products

**ACID CARBOLIC CRYSTALS.**—7d. to 8½d. per lb. Crude 60's, 2s. 4d. to 2s. 6d. per gall.  
**ACID CRESYLIC 99/100.**—2s. 2d. to 2s. 7d. per gall. Pure, 5s. to 5s. 2d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. 2d. to 2s. 3d. Dark, 1s. 6d. to 2s. Refined, 2s. 7d. to 2s. 10d. per gall.  
**ANTHRACENE.**—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.  
**ANTHRACENE OIL, STRAINED, 1080/1090.**—4½d. to 5½d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).  
**BENZOLE.**—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.  
**TOLUOLE.**—90%, 1s. 9d. to 2s. 1d. per gall. Firm. Pure, 1s. 11d. to 2s. 5d. per gall.  
**XYLOL.**—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.  
**CRESOTE.**—Cresylic, 20/24%, 6½d. to 7d. per gall.; Heavy, 6½d. to 6½d. per gall. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 2d. to 2½d. per gall. ex works. Salty, 7½d. per gall.  
**NAPHTHA.**—Crude, 8½d. to 8½d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent 90/190, 1s. to 1s. 3d. per gall.  
**NAPHTHALENE, CRUDE.**—Drained Cresote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

**NAPHTHALENE.**—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.  
**PITCH.**—Medium soft, 47s. 6d. per ton, f.o.b., according to district. Nominal.  
**PYRIDINE.**—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

### Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

**ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).**—10s. 9d. per lb.  
**ACID ANTHRANILIC.**—6s. per lb. 100%.  
**ACID BENZOIC.**—1s. 8½d. per lb.  
**ACID GAMMA.**—4s. 6d. per lb.  
**ACID H.**—3s. per lb.  
**ACID NAPHTHIONIC.**—1s. 6d. per lb.  
**ACID NEVILLE AND WINTHER.**—4s. 9d. per lb.  
**ACID SULPHANILIC.**—8½d. per lb.  
**ANILINE OIL.**—8d. per lb. naked at works.  
**ANILINE SALTS.**—8d. per lb. naked at works.  
**BENZALDEHYDE.**—2s. 3d. per lb.  
**BENZIDINE BASE.**—3s. 3d. per lb. 100% basis d/d.  
**BENZOIC ACID.**—1s. 8½d. per lb.  
**o-CRESOL 29/31° C.**—£3 1s. 10d. per cwt., in 1 ton lots.  
**m-CRESOL 98/100%.**—2s. 9d. per lb., in ton lots d/d.  
**p-CRESOL 32/34° C.**—2s. per lb., in ton lots d/d.  
**DICHLORANILINE.**—1s. 10d. per lb.  
**DIMETHYLANILINE.**—1s. 11d. per lb.  
**DINITROBENZENE.**—8d. per lb. naked at works. £75 per ton.  
**DINITROCHLOROBENZENE.**—£84 per ton d/d.  
**DINITROTOLUENE.**—48/50° C. 7½d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.  
**DIPHENYLAMINE.**—2s. 10d. per lb. d/d.  
**a-NAPHTHOL.**—2s. per lb. d/d.  
**B-NAPHTHOL.**—10d. per lb. d/d.  
**a-NAPHTHYLAMINE.**—1s. 3d. per lb.  
**B-NAPHTHYLAMINE.**—3s. per lb.  
**o-NITRANILINE.**—5s. 9d. per lb.  
**m-NITRANILINE.**—3s. per lb. d/d.  
**p-NITRANILINE.**—1s. 8d. per lb.  
**NITROBENZENE.**—6d. per lb. naked at works.  
**NITRONAPHTHALENE.**—1s. 3d. per lb.  
**R. SALT.**—2s. 2d. per lb.  
**SODIUM NAPHTHIONATE.**—1s. 8½d. per lb. 100% basis d/d.  
**o-TOLUIDINE.**—8d. per lb.  
**p-TOLUIDINE.**—1s. 9d. per lb. naked at works.  
**m-XYLIDINE ACETATE.**—2s. 6d. per lb. 100%.  
**N. W. ACID.**—4s. 9d. per lb. 100%.

### Wood Distillation Products

**ACETATE OF LIME.**—Brown, £9 15s. to £10 5s. per ton. Grey £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.  
**ACETONE.**—£78 per ton.  
**CHARCOAL.**—£6 to £8 10s. per ton, according to grade and locality.  
**IRON LIQUOR.**—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.  
**WOOD CRESOTE.**—1s. 9d. per gall. Unrefined.  
**WOOD NAPHTHA, MISCIBLE.**—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.  
**WOOD TAR.**—£3 10s. to £4 10s. per ton.  
**BROWN SUGAR OF LEAD.**—£38 per ton.

### Rubber Chemicals

**ANTIMONY SULPHIDE.**—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.  
**ARSENIC SULPHIDE, YELLOW.**—1s. 10d. to 2s. per lb.  
**BARYTES.**—£5 10s. to £7 per ton, according to quality.  
**CADMIUM SULPHIDE.**—5s. to 6s. per lb.  
**CARBON BISULPHIDE.**—£25 to £27 10s. per ton, according to quantity.  
**CARBON BLACK.**—5½d. per lb., ex wharf.  
**CARBON TETRACHLORIDE.**—£40 to £50 per ton, according to quantity. drums extra.  
**CHROMIUM OXIDE, GREEN.**—1s. 2d. per lb.  
**DIPHENYLGUANIDINE.**—3s. 9d. per lb.  
**LEAD HYPOSULPHITE.**—9d. per lb.  
**LITHOPONE, 30%.**—£20 to £22 per ton.  
**SULPHUR.**—£10 to £13 per ton, according to quality.  
**SULPHUR CHLORIDE.**—4d. to 7d. per lb., carboys extra.  
**SULPHUR PRECIP. B. P.**—£55 to £60 per ton.  
**THIOCARBAMIDE.**—2s. 6d. to 2s. 9d. per lb., carriage paid.  
**THIOCARBANILIDE.**—2s. 1d. to 2s. 3d. per lb.  
**ZINC SULPHIDE.**—8d. to 11d. per lb.

**Pharmaceutical and Photographic Chemicals**

**ACID, ACETIC, PURE, 80%.**—£37 per ton ex wharf London, barrels free.

**ACID, ACETYL SALICYLIC.**—2s. 9d. to 2s. 11d. per lb., according to quantity.

**ACID, BENZOIC, B.P.**—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

**ACID, BORIC B.P.**—Crystal, £32 per ton; powder, £36 per ton; extra fine powder, £38 per ton. Packed in 2-cwt. bags carriage paid any station in Great Britain.

**ACID, CAMPHORIC.**—19s. to 21s. per lb.

**ACID, CITRIC.**—1s. 11d. to 1s. 11½d. per lb., less 5%.

**ACID, GALLIC.**—2s. 8d. per lb. for pure crystal, in cwt. lots.

**ACID, MOLYBDIC.**—5s. 3d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.

**ACID, PYROGALLIC, CRYSTALS.**—7s. 3d. per lb. Resublimed, 8s. 3d.

**ACID, SALICYLIC, B.P. PULV.**—1s. 5d. to 1s. 7d. per lb. Technical.—1s. to 1s. 2d. per lb.

**ACID, TANNIC B.P.**—2s. 8d. to 2s. 10d. per lb.

**ACID, TARTARIC.**—1s. 4d. per lb., less 5%.

**ACETANILIDE.**—1s. 5d. to 1s. 8d. per lb. for quantities.

**AMIDOL.**—7s. 6d. to 9s. per lb., d/d.

**AMIDOPYRIN.**—7s. 9d. to 8s. per lb.

**AMMONIUM BENZOATE.**—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.

**AMMONIUM CARBONATE B.P.**—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimed, 1s. per lb.

**AMMONIUM MOLYBDATE.**—4s. 9d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.

**ATROPHINE SULPHATE.**—9s. per oz.

**BARBITONE.**—5s. 9d. to 6s. per lb.

**BENZONAPHTHOL.**—3s. to 3s. 3d. per lb. spot.

**BISMUTH CARBONATE.**—8s. 9d. per lb.

**BISMUTH CITRATE.**—8s. 3d. per lb.

**BISMUTH SALICYLATE.**—8s. 3d. per lb.

**BISMUTH SUBNITRATE.**—7s. 6d. per lb.

**BISMUTH NITRATE.**—Cryst. 5s. 3d. per lb.

**BISMUTH OXIDE.**—11s. 3d. per lb.

**BISMUTH SUBCHLORIDE.**—10s. 3d. per lb.

**BISMUTH SUBGALLATE.**—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

**BISMUTH ET AMMON LIQUOR.**—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.

**BORAX B.P.**—Crystal, £20 per ton; powder, £21 per ton. Packed in 1- or 2-cwt. bags carriage paid any station in Great Britain.

**BROMIDES.**—Ammonium, 1s. 11½d. per lb.; potassium, 1s. 8½d. per lb.; granular, 1s. 7½d. per lb.; sodium, 1s. 10½d. per lb. Prices for 1 cwt. lots.

**CALCIUM LACTATE.**—B.P., 1s. 2d. to 1s. 3d. per lb., in 1-cwt. lots.

**CAMPOR.**—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.

**CHLORAL HYDRATE.**—3s. 1d. to 3s. 4d. per lb.

**CHLOROFORM.**—2s. 4½d. to 2s. 7½d. per lb., according to quantity.

**CRESOTIC CARBONATE.**—6s. per lb.

**ETHERS.**—S.G. 730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.

**FORMALDEHYDE, 40%.**—37s. per cwt., in barrels, ex wharf.

**GUAIACOL CARBONATE.**—4s. 6d. to 4s. 9d. per lb.

**HEXAMINE.**—2s. 3d. to 2s. 6d. per lb.

**HOMATROPINE HYDROBROMIDE.**—30s. per oz.

**HYDRASTINE HYDROCHLORIDE.**—English make offered at 120s. per oz.

**HYDROGEN PEROXIDE (12 VOLS.).**—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.

**HYDROQUINONE.**—3s. 9d. to 4s. per lb., in cwt. lots.

**HYPOPHOSPHITES.**—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.

**IRON AMMONIUM CITRATE.**—B.P., 2s. 8d. to 2s. 9d. per lb. Green, 2s. 10d. to 3s. per lb. U.S.P., 2s. 7d. to 2s. 10d. per lb.

**IRON PERCHLORIDE.**—18s. to 20s. per cwt., according to quantity.

**IRON QUININE CITRATE.**—B.P., 8½d. to 9½d. per oz., according to quantity.

**MAGNESIUM CARBONATE.**—Light commercial, £31 per ton net.

**MAGNESIUM OXIDE.**—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

**MENTHOL.**—A.B.R. recrystallised B.P., 18s. 6d. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals 9s. 6d. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. per lb.

**MERCURIALS B.P.**—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

**METHYL SALICYLATE.**—1s. 6d. to 1s. 8d. per lb.

**METHYL SULPHONAL.**—18s. 6d. to 20s. per lb.

**METOL.**—9s. to 11s. 6d. per lb. British make.

**PARAFORMALDEHYDE.**—1s. 9d. per lb. for 100% powder.

**PARALDEHYDE.**—1s. 4d. per lb.

**PHENACETIN.**—3s. 2½d. to 3s. 9d. per lb.

**PHENAZONE.**—5s. 11d. to 6s. 1½d. per lb.

**PHENOLPHTHALEIN.**—5s. 11d. to 6s. 1½d. per lb.

**POTASSIUM BITARTRATE 99/100% (Cream of Tartar).**—104s. per cwt., less 2½ per cent.

**POTASSIUM CITRATE.**—B.P.C., 2s. 6d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.

**POTASSIUM FERRICYANIDE.**—1s. 9d. per lb., in cwt. lots.

**POTASSIUM IODIDE.**—16s. 8d. to 17s. 2d. per lb., according to quantity.

**POTASSIUM METABISULPHITE.**—6d. per lb., 1-cwt. kegs included f.o.r. London.

**POTASSIUM PERMANGANATE.**—B.P. crystals, 5½d. per lb., spot.

**QUININE PHOSPHATE.**—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.

**RESORCIN.**—2s. 10d. to 3s. per lb., spot.

**SACCHARIN.**—43s. 6d. per lb.

**SALOL.**—2s. 3d. to 2s. 6d. per lb.

**SODIUM BENZOATE, B.P.**—1s. 8d. to 1s. 11d. per lb.

**SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.**—2s. 2d. per lb., B.P.C. 1923, and U.S.P. ix—2s. 6d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.

**SODIUM FERROCYANIDE.**—4d. per lb., carriage paid.

**SODIUM HYPOSULPHITE, PHOTOGRAPHIC.**—£15 per ton, d/d consignee's station in 1-cwt. kegs.

**SODIUM NITROPRUSSIDE.**—16s. per lb.

**SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).**—100s. per cwt. Crystals, 5s. per cwt. extra.

**SODIUM SALICYLATE.**—Powder, 2s. 2d. to 2s. 4d. per lb. Crystal, 2s. 3d. to 2s. 5d. per lb.

**SODIUM SULPHIDE, PURE RECRYSTALLISED.**—10d. to 1s. 1d. per lb.

**SODIUM SULPHITE, ANHYDROUS.**—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.

**SULPHONAL.**—9s. 6d. to 10s. per lb.

**TARTAR EMETIC, B.P.**—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.

**THYMOL.**—Puriss., 9s. 1d. to 9s. 4d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

**Perfumery Chemicals**

**ACETOPHENONE.**—7s. per lb.

**AUBEPINE (EX ANETHOL).**—12s. per lb.

**AMYL ACETATE.**—2s. 6d. per lb.

**AMYL BUTYRATE.**—5s. per lb.

**AMYL CINNAMIC ALDEHYDE.**—12s. per lb.

**AMYL SALICYLATE.**—3s. per lb.

**ANETHOL (M.P. 21/22° C.).**—6s. 6d. per lb.

**BENZALDEHYDE FREE FROM CHLORINE.**—2s. 6d. per lb.

**BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.**—2s. per lb.

**BENZYL ALCOHOL FREE FROM CHLORINE.**—2s. per lb.

**BENZYL BENZOATE.**—2s. 3d. per lb.

**CINNAMIC ALDEHYDE NATURAL.**—13s. 3d. per lb.

**COUMARIN.**—8s. 3d. per lb.

**CITRONELLOL.**—10s. 6d. per lb.

**CITRAL.**—8s. per lb.

**ETHYL CINNAMATE.**—6s. 6d. per lb.

**ETHYL PHTHALATE.**—2s. 9d. per lb.

**EUGENOL.**—10s. 6d. per lb.

**GERANIOL (PALMAROSA).**—19s. per lb.

**GERANIOL.**—7s. 6d. to 10s. per lb.

**HELIOTROPINE.**—7s. per lb.

**ISO EUGENOL.**—12s. per lb.

**LINALOL.**—Ex Bois de Rose, 12s. per lb. Ex Shui Oil, 10s. per lb.

**LINALYL ACETATE.**—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 12s. per lb.

**PHENYL ETHYL ACETATE.**—11s. per lb.

**PHENYL ETHYL ALCOHOL.**—9s. 6d. per lb.

**RHODINOL.**—48s. per lb.

**SAFROL.**—2s. per lb.

**TERPINEOL.**—1s. 6d. per lb.

**VANILLIN, EX CLOVE OIL.**—13s. to 15s. per lb. Ex Guaiacol, 13s. to 14s. per lb.

**Essential Oils**

**ALMOND OIL.**—Foreign S.P.A., 10s. per lb.

**ANISE OIL.**—4s. per lb.

**BERGAMOT OIL.**—12s. 6d. per lb.

**BOURBON GERANIUM OIL.**—18s. 3d. per lb.

**CAMPOR OIL, WHITE.**—160s. per lb.

**CASSIA OIL, 80/85%.**—5s. per lb.

**CINNAMON OIL LEAF.**—8s. 6d. per oz.

**CLOVE OIL (90/92%).**—8s. per lb.

**EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.**—1s. 10d. per lb.

**LAVENDER OIL.**—Mont Blanc, 38/40%, 13s. 3d. per lb.

**LEMON OIL.**—8s. 9d. per lb.

**LEMONGRASS OIL.**—4s. per lb.

**PALMA ROSA.**—11s. 6d. per lb.

**PEPPERMINT OIL.**—English, 70s. per lb.; Wayne County, 15s. per lb.; Japanese, 5s. 6d. per lb.

**PETITGRAIN.**—8s. per lb.

## Scottish Chemical Market

*The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, January 1, 1930.

DURING the past week or so business in the heavy chemical market has been rather quiet, due, no doubt, to the seasonal holidays. Quite a number of inquiries have been received, however, for requirements contracts over next year. There is one important change in price to be reported, viz., acetone, which is reduced by £5 per ton as from January 1. Other chemicals remain practically on the same level as last report.

### Industrial Chemicals

ACETONE, B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—This material is still scarce for immediate supply but prices remain unchanged as follows: 98/100% glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC, ICE CRYSTALS.—Prompt delivery difficult to obtain and prices quoted for early delivery round about 9½d. per lb. delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Quoted 2s. 2d. per lb., less 5%, ex store, prompt delivery. Rather cheaper offers for early delivery from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80% QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at about 3½d. per lb., ex store. Offered from the Continent at 3½d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 5d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 88°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material quoted £37 per ton, ex wharf. On offer for prompt shipment from China at £34 per ton, c.i.f. U.K. ports.

ARSENIC WHITE POWDERED.—Now quoted £18 per ton, ex wharf, prompt despatch from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4 ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Remains steady at about £36 10s. per ton, ex works.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Price now £37 10s. per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½%, delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb. delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum 2½ tons to be taken.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store. Offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99½/100%.—Powder quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIAN (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6½d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered, 98/99%, £17 10s. per ton in drums, £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums, and £14 12s. 6d. per ton for 70/75% in drums, all carriage paid buyers' stations, minimum 4-ton lots, for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyers' premises with concession for contracts.

SODIUM CARBONATE. (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 13s. per ton, ex quay, minimum 4-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Chilean producers are now offering at £9 9s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, but demand in the meantime is small.

SODIUM PRUSSIAN.—Quoted 5½d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid, 60/62%, £9 per ton. Broken, 60/62%, £10 per ton. Crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material now offered at round about £20 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—Please note that the above prices are for bulk business and are not to be taken as applicable to small parcels.

### Sewage Treatment Plant for U.S.A. Request for British Tenders

WE have received through D. Adamson and Co., Ltd., of Dukinfield, Ashton-under-Lyne, an inquiry from the Honolulu Iron Works Co., consulting and contracting engineers, of 105, Broadway, New York, respecting designs for a sewage treatment plant. The New York company writes:—

"In connection with a sewage treatment plant, one of our clients desires quotations on a machine to receive screened sewage from 84,000,000 U.S. gallons per day of 24 hours, the screened sewage containing about 90 per cent. moisture; the machine to press centrifugally or otherwise dehydrate the sewage to such an extent that it can be burned economically. If you make such a machine or can refer this inquiry to any other maker we would be glad to have a quotation from you or them. Your quotation should be accompanied with full description and specifications, together with sufficient explanatory drawings to indicate the general operation. In addition the makers must fully guarantee the machine for the purpose intended under tests made by our client's county engineers. The solid material to be screened from the above quantity of sewage is estimated at 2 tons (\$2,000 ea.) per hour—namely, 48 tons per day. If a stand-by machine is required this should be so stated in your quotation."

British firms interested in the inquiry are requested to communicate direct with the New York company.



## Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, January 2, 1930.

ALTHOUGH there is little at the moment to justify any hope of material change in the cotton textile industry, the chemical market here, with its customary end-of-the-year optimism, is looking for "better things." Business generally has, of course, been considerably curtailed by the holidays, but a satisfactory feature of recent operations has been the volume of contract buying in a good many lines. For the most part, quotations keep up on a steady to firm level, although there are one or two exceptions.

### Heavy Chemicals

A fair volume of inquiry has been in evidence in the case of caustic soda, and contract bookings in this section have been pretty good at the range of from £12 15s. to £14 per ton, according to quality. Bicarbonate of soda has also attracted attention and current values are firm on the basis of £10 10s. per ton. Business in the case of phosphate of soda has been on rather moderate lines, but prices are reasonably steady at round £11 per ton for the dibasic material. Hyposulphite of soda is on the quiet side, with offers of the photographic quality at from £15 to £15 10s. per ton and of the commercial at £9. Prussiate of soda keeps very firm and a steady trade in this section is going through, quotations ranging from 4½d. to 5½d. per lb., according to quantity. Continued firmness characterises the alkali section, a fair demand being reported on the basis of £6 per ton. With regard to sulphide of sodium, a fair weight of business has been placed of late on forward delivery account, at the range of about £8 2s. 6d. to £9 2s. 6d. per ton for crystals, and £10 to £14 per ton, according to quantity, for the 60-65 per cent. concentrated solid quality. Only moderate activity is displayed in the case of chlorate of soda, value of which range from about 2½d. to 2¾d. per lb. Bichromate of soda keeps very firm and fair amount of buying interest is being shown at about 3½d. per lb.

Only a quiet demand has been reported this week in the case of caustic potash and the price situation in respect of this material is not too strong, offers being in the neighbourhood of about £30 10s. per ton for the 90 per cent. quality. Carbonate of potash is steady and in moderate inquiry at £26 5s. per ton. Yellow prussiate of potash continues in fair request and prices are fully maintained at from 6½d. to 7½d. per lb., according to quantity. Moderate sales of chlorate of potash are being put through, with value still in the neighbourhood of 2½d. per lb. Permanganate of potash meets with a quiet demand at from 5½d. to 5s. 5½d. per lb. for the B.P. grade and about 5½d. per lb. for the commercial quality. Bichromate of potash is firm and fairly active on a contract basis of 4½d. per lb.

There has been no quotable change in the position of arsenic, the demand for which is on quiet lines at round £16 per ton at the mines, for white powdered, Cornish makes. Buying interest in sulphate of copper this week has been very moderate at about £26 15s. per ton, f.o.b. The acetates of lime have been in generally quiet request, with the brown material at round £7 10s. per ton and the grey at £15 15s. Current offers of the acetates of lead are at £38 10s. to £39 per ton for the brown and £39 10s. for white, with nitrate on the easy side at about £33 5s.

### Acids and Tar Products

Inquiry for citric acid at the moment is only on a moderate scale, and at round 2s. per lb., or at slightly below this figure, the tendency seems to be somewhat weak. Tartaric acid also has given way a little, current values in this section being at 1s. 4½d. per lb. Oxalic acid is quiet but steady at £1 13s. per cwt., ex store. Acetic acid keeps firm, with the glacial quality selling at round £66 per ton and the 80 per cent. commercial material at £36 to £37.

The by-products are steady generally, although business this week has been on a restricted scale. Pitch is maintained at about 47s. 6d. per ton, f.o.b., with creosote oil at from 4½d. to 4¾d. per gallon, naked, and solvent naphtha as 1s. 4½d. per gallon. Carbolic acid continues scarce for prompt delivery business and offers are firm at 9½d. to 9¾d. per lb. for odd lots of crystals, and round 2s. 7d. per gallon, naked, for 60's crude.

## London Chemical Market

London, January 2, 1930.

HOLIDAY influences are still affecting the market, and little, if any, alteration in prices and conditions has occurred since the publication of the last report.

### Scottish Coal Tar Products

THIS market, like all other markets at this season, is very quiet, but the tone is one of optimism, and prices are, on the whole, very steady. Creosote oil is the one exception, production being much greater than the demand.

**Cresylic Acid.**—Market is quiet and prices are easy. Pale 99/100% is 1s. 11d. to 2s. 1d. per gallon; pale 97/99%, 1s. 9½d. to 1s. 10½d. per gallon; dark 97/99%, 1s. 8d. to 1s. 9d. per gallon; high boiling 1s. 10½d. to 2s. 0½d. per gallon, all at works in buyers' packages.

**Carbolic Sixties.**—The value is lower at 2s. 4d. to 2s. 6d. per gallon for ordinary quality.

**Creosote Oil.**—The outlook is not bright and prices are likely to remain at a low level until U.S.A. resume buying. To-day's values are as follows: Specification oil, 4d. to 4½d.; gas works ordinary, 3d. to 3½d.; washed oil, 3½d. to 3¾d.; all per gallon f.o.r. works naked.

**Coal Tar Pitch.**—Prices are firm in this area at 52s. 6d. to 55s. per ton for coke oven and horizontal, and 50s. to 52s. 6d. per ton for vertical. Nominal export price is about 5s. per ton lower than the above.

**Blast Furnace Pitch** is unchanged at 30s. per ton at works for home trade and 35s. per ton f.a.s. Glasgow for export.

**Refined Coal Tar.**—Prices are firm and inclined to rise. Value is about 3½d. to 4½d. per gallon in buyers' packages at works.

**Blast Furnace Tar** is steady at 2½d. per gallon free on rails works naked.

**Crude Naphtha.**—Value remains steady at about 4½d. to 5½d. per gallon, according to district and quality.

**Water White Products** continue quiet. 90/160 solvent is 1s. 1d. to 1s. 2d. per gallon; heavy solvent, 90/190, 1s. to 1s. 0½d. per gallon; benzol, 1s. 5d. to 1s. 5½d. per gallon, all ex works in buyers' packages.

### South Wales By-Products

AN unsatisfactory South Wales by-products year closed quietly, business being quiet and the immediate outlook far from satisfactory. Pitch remains quiet with prices unsettled round about 49s. to 50s. per ton, delivered. Road tar has a moderate call at 11s. to 13s. per 40-gall. barrel. Refined tars have a slightly stronger demand, but prices, both for coke oven and gasworks' tar, are unchanged. Motor benzol is more active, and is in good request at from 1s. 3½d. to 1s. 5½d. per gall. Solvent naphtha has improved slightly, but heavy naphtha remains in weak demand. Solvent naphtha quotations range from 1s. 2½d. to 1s. 4½d. per gall., and heavy from 11d. to 1s. 1d. per gall. The patent fuel and coke exports are unchanged, but the indications are that calls will be heavier from now onwards. Patent fuel quotations, ex-ship Cardiff, Swansea, and Newport are unchanged, while coke quotations are also unchanged.

### Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

**ACETONE, COMMERCIAL.**—The Director-General, India Store Department, Belvedere Road, London, S.E.1, invites tenders for 500 cwt. acetone, commercial (sample required with tender). Tenders due January 2, 1930. Forms of tender available from the above at a fee of 5s., which will not be returned.

### Graesser-Monsanto Chemical Works Dinner

AN enjoyable dinner was given to representative members of Graesser-Monsanto Chemical Works, Ltd., at the invitation of the directors on December 27. Some forty members were present, the idea being to strengthen further the goodwill existing between the works at Ruabon, North Wales, and the London selling end of the business. The underlying message of every speech was one of confidence for future progress, and this was strongly confirmed by a telegraphed message from the chairman of the company (Mr. John F. Queeny). The dinner was held at the Wynstay Hotel, Wrexham, and the entertainment which followed was much enjoyed.

## Company News

**YORKSHIRE DYEWARE AND CHEMICAL CO.**—An interim dividend of 2½ per cent. is announced.

**LIVERPOOL NITRATE CO.**—The profits for the year ended June 30 amounted to £53,886. After deducting the adverse balance brought into the accounts, there remains a credit balance of £34,963 to be carried forward.

**CAPE ASBESTOS CO.**—A dividend of 5 per cent. on the preference shares and an interim dividend of 5 per cent. on the ordinary shares and an equivalent interim dividend on the preference shares are payable to shareholders registered December 20, 1929.

**IMPERIAL CHEMICAL INDUSTRIES, LTD.**—It is announced that the new issue department at Broadway Buildings, 50/64, Broadway, Westminster, S.W.1, will be closed on December 21 and communications should now be addressed to the company's registered office, Imperial Chemical House, Millbank, London, S.W.1, marked "Share Department—New Issue."

**BROTEX CELLULOSE FIBRES.**—The first report covering the period September 13, 1928, to October 31, 1929, states that trial crops of brotex have been grown in England, and tests are now being carried out in Kenya, Australia, Canada, France, Germany, Spain and U.S.A. Valuable information has been obtained regarding plant's growth. Negotiations for the grant of options for sale of Brotex rights have been concluded for United States and Spain, amount paid or payable for such options amounting to £60,000, out of which company is liable to spend £12,000 in those countries, leaving £48,000. Against this the directors have written off expenditure incurred in other negotiations amounting to £4,565, and propose to write off total expenditure on general development amounting to £30,921.

## Institution of Chemical Engineers

### Progress Notes

THE January bulletin of the Institution of Chemical Engineers states that during the last quarter of 1929 the following were elected :—

**Members.**—S. Alker, B.Sc., F.I.C., Forestal Land, Timber and Railway Co., Ltd., Argentine; M. B. Donald, A.R.C.S., M.Sc., F.I.C., Asiatic Petroleum Co., Ltd., London; J. B. Firth, D.Sc., F.I.C., University College, Nottingham; T. H. Gant, A.R.C.S., A.I.C., Geo. T. Holloway and Co., Ltd., Cuxton; G. H. Harrison, Derwenthaugh Coke Works, Blaydon-on-Tyne; L. A. Jordon, D.Sc., A.R.C.S., D.I.C., F.I.C., Research Association of British Paint, Colour and Varnish Manufacturers, London (Transfer); L. H. Lampitt, D.Sc., F.I.C., J. Lyons and Co., Ltd., London; W. C. Peck, M.Sc., A.I.C., Burgoyne Burbridges and Co., Ltd., London; W. K. Porteous, Kennedy and Donkin, London; W. H. Rawles, Haslam and Newton, Ltd., Derby; H. E. Temple, D. L. Flack and Son, Ltd., London; J. Terrace, South Suburban Gas Co., Sydenham; A. J. V. Underwood, D.Sc., Destilacija Drva, D.D., Yugoslavia.

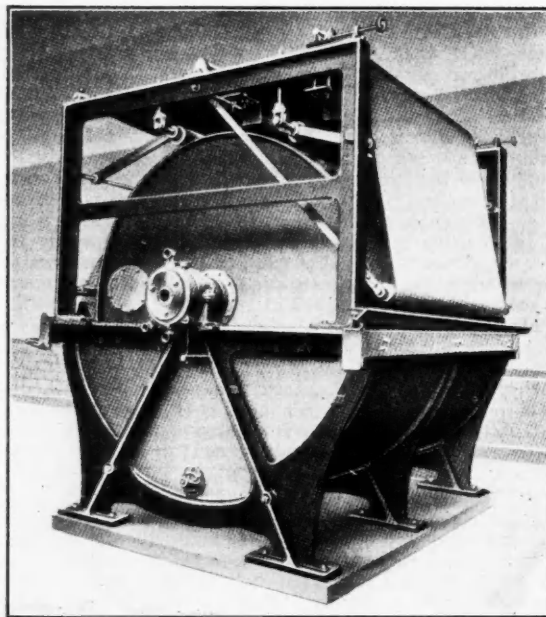
**Associate Members.**—W. B. Ballantine, African Tin Recovery Co., Ltd., Port Elizabeth; B. G. Banks, A.C.G.I., A.I.C., Trinidad Leaseholds, Ltd., Trinidad; B. Dunglinson, Electroflo Meters Co., Ltd., London; H. Hayhurst, A.I.C., L.M.S. Railway, Horwich; M. S. Mainland, B.Sc., A.I.C., Iraq Petroleum Co., Ltd., London; P. E. Masters, A.M. Inst.C.E., Royal Filling Factories, Royal Arsenal, Woolwich; W. S. Richards, B.Sc.Eng., A.M.I.Mech.E., Imperial Chemical Industries, Ltd. (Nobel Section).

The Joint Chemical Committee's memorandum on British Patent Law Reform will shortly be available, and members desirous of obtaining copies should advise the Honorary Secretary of the Institution immediately. The copies will cost 1s. each.

Mr. C. Chapman is now attached to the head office of the Græsser Monsanto Chemical Works as technical adviser. Mr. H. O. Greenhough has been appointed manager and engineer to James A. Beck, Ltd., of Belfast. Mr. A. B. Winterbottom has been appointed a senior assistant with Tube Investments, Ltd.

### Continuously Operating Suction-Cell Drum Filter

A NEW continuously operating suction-cell drum filter, type Imperial "Fine," has been put on the market by the Maschinenfabrik Imperial G.m.b.H., whose sole representative in Great Britain is Mr. L. A. Mitchell, of 20, Cooper Street, Manchester. The material to be filtered is pumped by the slurry pump into the filter tank in bigger quantities than the filter drum can handle. The resulting surplus is continually carried back to the reservoir, whereby a continuous motion is produced and any precipitation of the material is prevented. In special cases an agitator is provided. The filter drum is made of any desired material, e.g., wood, iron or any other metal, according to the material to be treated; on its surface the drum carries a large number of flat filter boxes, over which



FILTER WITH PRESSING AND WASHING BELT AND WASHING TROUGH.

the filter cloth is laid. The filter cloth consists of two parts. The free end of each filter cell is filled with a corresponding piece of woven wire made of a material which corresponds to the characteristics of the product to be filtered. Round the whole surface of the drum runs a rough filter cloth of a special make, upon which lies the real filter cloth of finest tissue, if necessary, even of silk. For corrosive materials these filter cloths can also be made of woven metal, such as copper, bronze, Monel metal, etc. The two filter cloths lie in one piece round the drum, and the ends are only once fastened at the edge. Between each cell a tight string presses the filter cloth into grooves, whilst at the edges of the drum this cross-running string and the filter cloths are held by a strong cord, which is also pressed into grooves running parallel to the edges of the drum; thus no metal whatever is used for fastening the filter cloth. The filter has neither knife, scraper nor discharge rolls, and discharges by endless cord belts.

### Merchandise Marks : Scientific Glassware

AN Order in Council, entitled the Merchandise Marks (Imported Goods) No. 5 Order, 1929, was made on December 17. It requires the following classes and descriptions of imported goods, among others, to bear an indication of origin :—Scientific glassware (as from March 17, 1930); domestic, fancy and illuminating glassware (as from June 17, 1930). The Order will apply at the time of sale and exposure for sale. In the case of scientific glassware it will also apply at the time of importation. The text of the Order in draft form was printed in the *Board of Trade Journal* on November 7, 1929. The Order in Council as made is being published, and copies will shortly be obtainable from H.M. Stationery Office.

# OIL TANK FIRES



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## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

### County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

TEARE, J. H., Richard Street Mills, Portwood, Stockport, gum and starch manufacturer. (C.C., 4/1/30.) £16 7s. November 13.

WALTON (A.) AND CO., Bridge Mills, Tarvin Bridge, Chester, soap manufacturers. (C.C., 4/1/30.) £76 10s. 9d. November 22.

### Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary, but such total may have been reduced.]

AGUAS BLANCAS NITRATE CO. (1928), LTD., London, E.C. (M., 4/1/30.)—Registered December 16, charge, to bank charged on company's present and future stocks of nitrate bags, and petroleum and iodine. \*£250,000. November 25, 1929.

CRUICKSHANK (R.), LTD., Birmingham, chemical manufacturers, etc. (M., 4/1/30.) Registered December 10, £13,300 debentures; general charge (subject to 1st debentures). \*£4,000. October 17, 1929.

LYND (WILLIAM) AND CO. (1929), LTD., Leeds, oil refiners (M., 4/1/30.)—Registered December 13, mortgage and charge, to bank, charged on property in Leeds, also general charge.

MALONEY (C. E.) AND CO., LTD., Gillingham (Dorset), soap manufacturers, etc. (M., 4/1/30.) Registered December 10, to Lloyds Bank, Ltd., securing all moneys due or to become due to the bank; charged on properties at Gillingham, etc., also general charge. \*£10,000. December 31, 1928.

MANCHESTER DYERS (1914), LTD. (M., 4/1/30.) Registered December 14, £8,000 (not ex.) mortgage, to G. L. Hardcastle and another, 27, Sackville Street, Manchester; charged on Middleton Road Dyeworks, Crumpsall, etc., also general charge. \*£100. August 15, 1929.

#### Satisfactions

MANCHESTER DYERS (1914), LTD. (M.S., 4/1/30.) Satisfactions registered December 16, £8,000 and collateral mortgage, registered June 29, 1921.

### London Gazette, &c.

#### Companies Winding Up Voluntarily

GAS RESIDUAL PRODUCTS CO., LTD. (C.W.U.V., 4/1/30.) By special resolutions December 23rd. J. Young, 15, Corrennie Gardens, Edinburgh, J. M'Queen, Beechgrove, Uddingston, A. Fraser, Redholme, West Kilbride, and W. Hay, 10, Mansion House Road, Glasgow, appointed as liquidators.

#### Deed of Arrangement

[The following deeds of arrangement with creditors have been filed under the Deeds of Arrangement Act, 1914. Under this Act it is necessary that private arrangements other than those executed in pursuance of the Bankruptcy Act shall be registered within seven clear days after the first execution by the debtor or any creditor. These figures are taken from the affidavit filed with the registered deed, but may be subject to variation on realisation.]

MOON, Reginald Francis, 4, Brookfield Avenue, Crosby, analytical chemist. (D.A., 4/1/30.) Dated December 17, filed December 24. Trustee, H. C. Binns, 81, Dale Street, Liverpool, Certified Accountant. Secured creditors, £90; liabilities unsecured £928; assets, less secured claims, £390.

### New Companies Registered

CONSOLIDATED TIN SMELTERS, LTD.—Registered on December 28, as a "public" company. Nominal capital, £5,000,000 in £1 shares (2,000,000 non-cumulative preference and 2,000,000 ordinary. The remaining 1,000,000 shares may be issued as non-cumulative preference or ordinary shares as the directors shall determine). To acquire the whole or any portion of the share or loan capital or the assets or undertaking of the Cornish Tin Smelting Co., Ltd., Eastern Smelting Co., Ltd., Penpoll Tin Smelting Co., Ltd., Williams, Harvey and Co., Ltd., or of any other company, association, firm or person engaged or interested in any trade or businesses which this company is authorised to carry on, to carry on the business of a holding, investment and trust company, etc., to carry on the business of roasters, smelters, refiners, rollers, galvanisers and manufacturers of and dealers in metals, ores and mineral and metallurgical substances, manufacturing chemists, manufacturers and producers of and dealers in sulphuric and other acids, alkalis and chemicals, artificial fertilisers, manures, dips, sprays, vermifuges, fungicides, medicines and remedies, aniline and other dyes, pigments, paints and enamels, lithophone and zinc and other metallic oxides, etc. A subscriber: F. Hopton, 2, Bond Court, Walbrook, London, E.C.4

MINING AND CHEMICAL PRODUCTS, LTD.—Registered December 20. Nominal capital, £25,000 in £1 shares. Objects: To carry on the business of importers, exporters, extractors, refiners and manufacturers of and dealers in all kinds of ores, metals, minerals, chemicals and chemical products, fertilisers and fertilising products, etc. A subscriber: D. C. Tewson, 18, Austin Friars, London, E.C.2.

UNILEVER, LTD., Union House, St. Martin's-le-Grand, London, E.C.1.—Registered as a private company on December 27. Nominal capital, £100 in £1 shares. To acquire and hold bonds, debentures, debenture stock, scrip, obligations, shares, stocks or securities, to acquire any freehold or leasehold property in Great Britain or elsewhere, to turn to account the same, etc. The subscribers (each with one share) are: Margarine Union, Ltd. (A. Jurgens, junr., director, and D. Hardwick, secretary); D. Hardwick; Lever Brothers, Ltd. (L. H. H. Swann and H. Ballantyne, directors, and L. V. Fildes, secretary); and L. V. Fildes. The first directors (to number not less than two nor more than seven) are to be appointed by the subscribers. Anton Jurgens, junr., signs as director.

### New Companies Incorporated Outside the U.K.

TEDCASTLE, McCORMICK AND CO., LTD.—Particulars filed December 9, 1929, pursuant to Section 344 of the Companies Act, 1929. Nominal capital, £100,000 in £1 shares. The company was incorporated in Dublin on February 26, 1920, to acquire the business of coal, coke, charcoal, patent fuel, firewood and briquette merchants then carried on by a firm of similar name, and to adopt an agreement with British and Irish Steam Packet Co., Ltd.; also to carry on the business of chemical manufacturers, dye makers, etc. British address: 6, Spring Gardens, London, S.W.1, where J. W. Ratledge is authorised to accept service. Directors: Sir Alfred H. Read J.P., J. W. Ratledge, A. Forsyth, J. H. McLean and J. O'Dowd.

### Sodium Sulphide in the United States

THE growth in domestic production of sodium sulphide from 24,682 tons in 1921 to 46,494 tons in 1927 has enabled the American chemical industry to supply 90 per cent. of domestic requirements of this commodity. The remainder is supplied by imports, which averaged about 4,500 tons in 1927-28. The increased consumption corresponding to the above figures is attributable to greater activities in the chief consuming industries for this commodity, including manufacture and application of sulphur colours, tanning, mining and rayon.

Since sodium sulphide is made from sulphates, chiefly of barium and sodium, the important changes which are affecting the availability of these salts on the American market must be considered in understanding the economics of the question. Among these are the establishment and growth of the American barium chemical industry, of which sodium sulphide is a co-product, the synthetic nitrogen and hydrochloric acid industries which tend to make the by-product nitre cake unnecessary.

